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# DSU REPAIR PARTS STOCKOUTS

FINAL REPORT

DEPARTMENT OF THE ARMY  
HEADQUARTERS UNITED STATES ARMY  
TRAINING AND DOCTRINE COMMAND  
FORT MONROE, VIRGINIA 23651

U.S. ARMY QUARTERMASTER SCHOOL  
FORT LEE, VIRGINIA

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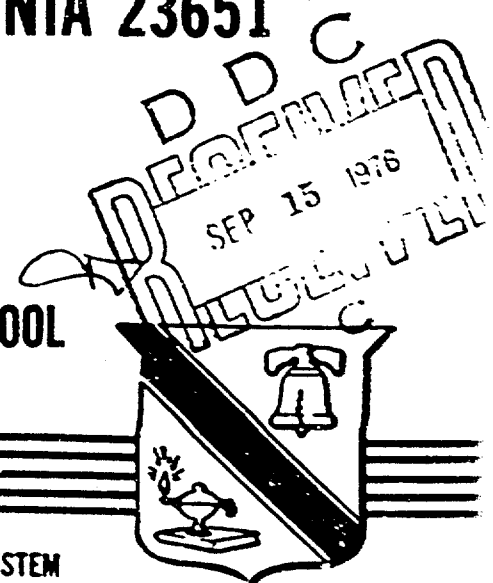
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### ACKNOWLEDGMENT

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This report has been approved by the Commander, US Army Logistics Center, and Headquarters, US Army Training and Doctrine Command.

The conclusions and recommendations are those of the Commandant, US Army Quartermaster School. They are based upon data gathered and analyzed by the Quartermaster School study team.

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### ABSTRACT

The DSU Repair Parts Stockouts Study was designed to identify the reasons for class IX zero balances at the divisional maintenance battalion level. Parts identified as problems at the retail level were also examined at the appropriate Army Materiel Command commodity command.

Data from four Army divisions in the continental United States and five Army Materiel Command commodity commands were used to support findings and recommendations.

In addition to zero balances, the subjects of cancellations, receipt procedures, training, followups, supply performance, supply management, procurement, and essentiality coding are discussed.

## SUMMARY

1. **INTRODUCTION.** It has been observed on repeated occasions that major items of equipment are deadlined for excessive periods of time due to the lack of parts. This situation indicates that the current demand supported supply system is operating at less than optimum efficiency. The possible causes for such a condition are numerous; however, an obvious reason would be requisitions for parts which are at zero balance at the direct support unit (DSU) level or at the wholesale level (Army Materiel Command National Inventory Control Points).

2. **PURPOSE.** The purpose of this study is to analyze the reasons for DSU and National Inventory Control Point (NICP) stockouts to determine areas where improvement can be made to improve support for major items of Army equipment.

### 3. DISCUSSION.

a. **Objectives.** The objectives of this study are to verify that there is a problem with repair parts requisitions not being filled due to stockouts at the DSU level, determine the reasons for stockouts, and develop recommendations to reduce repair parts stockouts.

#### b. Assumptions.

(1) The current state of knowledge as to the mission essentiality of repair parts is considered adequate for the purposes of this study.

(2) For all practical purposes Not Operationally Ready, Supply (NORS) requirements can be considered as being mission essential.

(3) The current supply system is basically sound and does not require major changes; however, areas exist where incremental improvements can be made that can be implemented within a year or less and which will improve system effectiveness.

c. **Scope.** This study was limited to peacetime operations in the continental United States (CONUS). Four CONUS divisions were used as the data base: the 82d Airborne, the 101st Airborne Division (Air Assault), the 1st Cavalry, and 2d Armored Divisions. Data gathered at the divisions were followed through the appropriate Army Materiel Command (AMC) commodity command. AMC Missile Command (MICOM), Defense Supply Agency, and General Services Administration activities were not included in the study.

d. Methodology.

(1) One of the major considerations of the study was to limit the effort to mission essential repair parts. For this reason only NORS requisitions were considered.

(2) The procedure followed was to collect a random sample of calendar year 1973 and early 1974 priority 02 and 03 requisitions from the four sample divisions. Following this, the stock numbers in the sample were matched with the Army Master Data File (AMDF) to obtain the weapons systems code. An end item sample was then selected and only the repair parts for the selected end items were used throughout the study, with two exceptions. Stock numbers from the repair parts sample not identified with the end items sample were used at the US Army Troop Support Command (TROSCOM) and stock numbers provided by the Transportation School were used at the US Army Electronics Command (ECOM). Requisition data were traced from the DSU to the appropriate AMC commodity command to obtain processing times, status, and status dates.

(3) Data and other information were obtained from machine produced reports or records when possible and manually when necessary. Statistical tests of hypothesis were used where appropriate.

(4) Considerable use was made of personnel interviews. When possible the results of these discussions were supported by local reports or other written documentation.

(5) A questionnaire was used to provide the basis of analysis in one case, the subject of training of Prescribed Load List (PLL) clerks.

4. FINDINGS.

a. Whether the entire repair parts sample data are used or only the data for the 14 items selected as an end item sample, the conclusion concerning order and shipping times is the same. Order and shipping times (OST's) for high priority requisitions are excessive when compared to the AR 725-50 standard of seven days.

b. Excessive OST's are symptomatic of more serious problems. The two major problems identified are zero balances and document processing problems. Authorized stockage list (ASL) zero balances in the sample divisions averaged 24 percent and zero balances with dues-out, 5 percent. At the installation level ASL zero balances averaged 19.5 percent. Stockouts are a function of the variables of inventory policy, to include addi-

tion and retention criteria. Addition and retention policy changes were not addressed since this subject has been examined in other studies. A component of inventory policy which was addressed was order and shipping times. Actual OST's which exceed those used in inventory policy will create zero balances. AR 710-2 provides for the computation of variable OST's by materiel categories. It was found that Combat Service Support System (CS3) units were using variable OST's but, Division Logistics System (DLOGS) units were not computing variable OST's. The Quartermaster School (QMS), has requested that the necessary changes be made to DLOGS to provide this capability.

c. A number of examples of document processing problems were identified. The most serious problems were excessive processing times from the unit to the appropriate NICP and those cases where units have parts due-in, the requisitions for which have never been received at the NICP. Command review of processing procedures at the local level should resolve some of the problems. In addition, planned changes to the Standard Army Intermediate Level Supply System (SAILS) program should improve the reconciliation situation. If not, additional study may be required to pinpoint specific processing and reconciliation problems and provide solutions. See chapter 2, section I, para 3.

d. AR 710-2 states that the maximum ASL size for a division maintenance battalion should not exceed 5,000 lines, and that a more stringent stockage policy may be used to reduce the ASL if it is excessive. Supply performance data for the sample divisions indicated that demand accommodation and satisfaction performance were below regulatory standards, in spite of the fact that ASL sizes were greater than 5,000 lines. Compliance with the 5,000-line standard may result in decreased supply performance and the validity of the standard is questionable.

e. A lack of inventory accuracy can result in the creation of zero balances or excesses. A sample inventory at the divisions revealed inventory accuracy of 43.9 percent, with overages and underages approximately equal. The inventory problem has been documented in other studies and appears to be a continuing problem. Written guidance on the subject is fragmented among a number of publications, which makes it difficult for an individual to fully understand all of the details which must be considered to properly conduct and reconcile a physical inventory. The QMS is in the process of preparing a training circular which will fully explain physical inventory procedures.

f. An unexpected finding of the study was a problem with cancellations. Eleven percent of the repair parts sample were cancellations. In two of the four sample divisions 26 percent of the NORS requisitions were later canceled. It was also found that 25.9 percent of division ASL requisitions and 32.5 percent

of nonstockage list (NSL) requisitions for parts which were canceled were actually shipped. It is understandably difficult to frustrate shipments; however, the chances of doing this can be increased if the need for a cancellation is made known faster than it is at the present time. It was found that the average time from the requisition document date to the request for cancellation date averaged 50.6 days for NSL items and 52.1 days for ASL items. In an effort to reduce this time, a proposed change to AR 725-50 will be recommended which will require a periodic review of requirements. See chapter 4, para 2.

g. The study revealed that in a number of cases units are waiting for parts which they have already received. Two different data sources support this conclusion and indicate problems in receipt procedures. Current published guidance appears adequate. Receipt procedures at the RSU level should be reviewed for compliance with TC 38-2-3 for DLOGS and FM 38-15 for CS3.

h. The training of individuals was felt to be a factor, not only in regard to zero balances, but in all areas of supply performance. It was found that 87 percent of the enlisted personnel checked at the DSU, division Materiel Management Agency (MMA) and maintenance battalion technical supply office level had received formal training in their military occupational specialties (MOS's). Because of the high level of training this area was not pursued further. The proficiency of the unit PLL clerk was also of interest because of this individual's key position in the repair parts supply system. Due to the number of individuals involved, a questionnaire was developed to test the knowledge of PLL clerks. The results were disappointing; the average correct response was 65.8 percent. The questionnaire revealed the need for additional training, specifically on-the-job-training (appendix D).

i. Zero balances ranged from 1.4 percent to 13.6 percent for the five NICP's visited. Of greater importance than the percentages of zero balances is the length of time that parts remain at zero balance. In a 13-month interval, considering all AMC NICP's, 83 percent of the parts that were at zero balance at the beginning of the period were still at zero balance at the end of the period. The challenge to management is to prevent zero balances rather than react to them after they occur.

j. Current AMC wholesale inventory policy is geared to matching demand accommodation to the assigned weapons system/end item operational readiness rate. This is a significant improvement over the use of fixed add-and-delete criteria; however, demand accommodation in itself does not indicate how well the customer is supported. Demand satisfaction is a better measure of customer satisfaction and it was found for all commodity

commands visited that demand satisfaction was less than 85 percent.

k. The repair parts which related to the 14 end item sample were supplied by three of the AMC commodity commands. Status and status dates obtained from the NICP's indicated that a large percentage of the completed requisitions had a no record (BF) status at the supporting NICP. This indicates that these requisitions were filled by the installation supporting the division (assuming the NICP history files are 100 percent correct). If this is the case the retail level has a serious processing problem, since OST for completed requisitions with a no record status ranged from 29.3 to 43 days.

l. The processing times for the open requisitions for the sample end items show excessive periods of time from the document date to the sample date and a large percentage of no record requisitions. This indicates that units are waiting for parts which they will never receive.

m. AMC item managers' files were reviewed for 61 stock numbers selected from the repair parts sample to determine the reasons for parts getting into bad stockage positions. The major reasons found were lack of agreement between actual requirements and the administrative leadtime (ALT) and/or production leadtime (PLT) used in inventory policy. A number of these difficulties resulted from failure of the item managers to use data available from the procurement directorates. Safety levels were a problem in some cases and were either excessive or inadequate. The lack of requirements determination time (RDT) and RDT quantities has been a problem but it may be resolved since the Department of Defense has provided verbal authority to use RDT. Additional funds, however, have not yet been provided for RDT. In addition to the foregoing, a number of miscellaneous problems were identified which contribute to zero balances.

n. In the procurement area, by far the greatest factor contributing to zero balances is delinquent deliveries on contracts. Whether or not additional emphasis should be placed on defaulting contractors for late delivery is a debatable subject, however, this study indicates that the general procedure is to revise delivery schedules rather than initiate default procedures.

o. Increased use of requirements-type contracts would appear to be an effective way to improve repair parts supply; however, there are a number of factors which limit the use of these contracts. The most serious is the current state of the economy which makes contractors reluctant to bid on fixed price contracts. A suggestion which may help is to increase the use of options for additional quantities and allow the bidders to bid separate prices for the initial quantity and the option quantity.

p. Increased use of preaward surveys would appear to be a means for improved contractor performance; however, it was found that this is already a general practice. The need for increased emphasis is indicated in this area, not from a quantity standpoint, but rather from a standpoint of quality, particularly in the area of the contractor's ability to meet scheduled delivery dates.

q. It was found in some cases that no bids were received on competitive solicitations. A sample at one command indicated that this situation occurred approximately three percent of the time. Although this is not a high percentage, it is a serious problem when it occurs. Outside of a new solicitation or a negotiated contract, few options remain. Fabrication is one option, but little effort was devoted to this subject in this study. Another option is to use the provisions of the Defense Production Act of 1950 to obtain contractor response. No evidence was found indicating that this Act was used for any of the parts examined in this study. This indicates the need for increased publicity and use of the provisions of the Act.

r. The management of the Army stock fund requires examination. The current procedure of allocating funds on a quarterly basis rather than full year funding results in deferment of purchases which, in retrospect, could have been made, and in repetitive procurements which increase the workloads of the procurement directorates. It also prevents large quantity buys, which are generally more attractive to industry and result in price advantages to the government.

s. Several of the commodity commands are using military officers to make routine liaison visits to installations and divisions to resolve supply and maintenance problems. The approach appears to be productive, but there is considerable variance in the liaison programs from one commodity command to another.

t. Requisition followups have been identified as a problem as a result of recent changes to AR 725-50. The system has been complicated and works to the disadvantage of the customer. The customer has the choice of using a document identifier code (DIC) AF which will reject the requisition if the followup precedes the requisition, or a DIC AT which will establish the requirement if the followup precedes the requisition. It seems logical that only one system is needed and it should establish a requirement if the requisition has not been received.

u. Forecasting of production leadtimes is not being accomplished and this appears to be the only procedure which will alleviate the discrepancies between contractor performance and



the leadtimes used in inventory policy. AMC is currently studying this subject and several ideas are presented in this report.

v. It was found that the concept of repair parts essentiality is not used in day-to-day supply management decisions. The concept of essentiality needs to be refined to provide a means of allocating scarce resources. Although some effort has been, and is being, expended on this subject, an acceptable procedure has not yet been developed to determine essentiality. A QMS proposal on essentiality is presented in Chapter 2, section II, para 10. The proposal, although not an optimum solution, provides for an early payoff starting with parts that are currently in trouble -- AMC's zero balances.

## 5. CONCLUSIONS.

a. Order and shipping times for high priority requisitions are excessive when compared to published standards.

b. The validity of the 5,000 line ASL objective specified in AR 710-2 for a maintenance battalion is questionable.

c. Inventory accuracy at the division level needs to be improved.

d. Cancellation procedures need to be improved at the unit and DSU level.

e. DSU receipt procedures need to be improved.

f. PLL clerks need additional training.

g. Procurement leadtimes used in inventory policy at the wholesale level are often not in agreement with actual conditions.

h. Requirements determination quantities are not being computed and stocked.

i. An increased fabrication capability within AMC may be required.

j. The Defense Production Act of 1950 is only being used to a limited extent to resolve unacceptable leadtime problems or those situations where no bids are received on a competitive procurement.

k. AMC commodity commands have established military liaison programs to make routine visits to divisions and installations; however, there is considerable variance in the programs from one command to another.

l. AR 725-50 has complicated followup procedures to the disadvantage of the customer.

m. The current policy for determining production leadtime has resulted in understated requirements in many cases.

n. The methodology for determining essentiality needs to be refined and parts need to be examined for proper coding to provide a priority system for the expenditure of limited funds.

## 6. RECOMMENDATIONS.

a. Recommend that portion of para 7-6b, C3, AR 710-2, 8 August 1975, which applies to a maintenance battalion be deleted; and para 3-27b(1)(a) and (b) be changed as follows: (a) Additions to the Authorized Stockage List (ASL) (fig. 3-49). Normally a demand criteria of six demands in the most recent 360-day period will be used to add an item to the ASL. Installations authorized to operate in accordance with the Economic Inventory Policy (EIP) will be governed by the procedures established in paragraph 3-31. Figure 3-9 consists of EIP stockage tables which are designed to provide an economic yet reasonable demand accommodation of 80 percent. (b) Deletions from the Authorized Stockage List (ASL) (fig. 3-49). When an item qualifies for inclusion on the ASL, it will be retained and reviewed for quantitative adjustment only for a period of 1 year (360 days). One year from the date the item was added to the ASL, the item must have experienced three or more demands within that year to be retained. This criteria is applicable to all subsequent reviews.

b. Recommend that if Department of the Army desires to control the size of ASLs, that this be accomplished by determining the effects of various stockage policy changes followed by appropriate changes to AR 710-2 (add/delete criteria and appropriate goals for demand accommodation and satisfaction). Refers to conclusion 5b.

c. Receipt procedures are adequately covered in current guidance; however, recommend additional command emphasis be given to this area (refers to conclusion 5e).

d. Recommend that the Training Extension Course prescribed load list program be made mandatory training for division PLL clerks, together with additional on-the-job training to explain local procedures (refers to conclusion 5f).

e. Recommend that AMC commodity commands review internal procedures to insure that maximum coordination is achieved between procurement and production personnel and item managers on the subject of procurement leadtime (refers to conclusion 5g).

f. Recommend that AMC take necessary action to budget for requirements determination quantities and change the applicable portions of AR 710-1 which, currently, do not permit the use of requirements determination time (refers to conclusion 5h).

g. Recommend that AMC publicize the provisions of the Defense Production Act of 1950 and apply the provisions of the law and the Defense Priorities System as appropriate (refers to conclusion 5j).

h. Recommend that AMC develop the necessary automatic data processing procedures to prevent the possibility of double shipments when a document identifier code AT followup is used by a customer. Upon completion of this action, recommend that chapter 3, section VIII, AR 725-50, be rewritten to provide for the use of one document identifier code for requisition followups, with the provision that the followup be treated by the supplier as a requisition if the requisition has not been received (refers to conclusion 5l).

i. Recommend that AMC continue its efforts to develop the methodology for forecasting production leadtimes (refers to conclusion 5m).

j. Recommend that the QMS suggestion concerning essentiality and essentiality coding (explained in chapter 2, section II, para 10) be jointly implemented, on a pilot project basis, by HQ AMC and the LOGC (refers to conclusion 5n).

## CHAPTER 1

## INTRODUCTION

1. PROBLEM. It has been observed on repeated occasions that major items of equipment are deadlined for excessive periods of time due to lack of parts. This situation indicates that the current demand supported supply system is operating at less than optimum efficiency. The possible causes for such a condition are numerous; however, an obvious reason would be requisitions for parts which are at zero balance at the direct support unit (DSU) level or at the wholesale level (Army Materiel Command National Inventory Control Points). An analysis of the reasons for DSU and National Inventory Control Points (NICP) stockouts should indicate where improvements can be made to increase support to major items of Army equipment.

2. BACKGROUND.

a. This study had its beginning with a study directive received from the Logistics Center (LOGC) on 25 July 1973, which tasked the Quartermaster School (QMS) to conduct a study on repair parts supply for low density end items. As a result of a series of meetings the study area was changed to zero balances. A separate study directive was not received for the stockouts study and, therefore, is omitted from the appendices to this report.

b. The first In-Process Review (IPR) for the DSU Repair Parts Stockouts Study was conducted on 26 February 1974 for the purpose of approving the proposed study plan. At that time the first phase of the project (division data collection) was approved by the Commander, LOGC. The progress and direction of the study effort was reviewed at each subsequent IPR and revised as necessary. The proposed study plan, dated 13 February 1974, was not approved in its entirety and was modified as the result of IPR meetings. The study effort experienced several changes of emphasis based upon receipt of new information, guidance, and analysis of each preceding phase of the study. For reasons mentioned the study plan has been omitted from the appendices.

c. The DSU Repair Parts Stockouts Study is but one study of a collection of studies and projects that form the LOGC Repair Parts Program. The Repair Parts Program was established on 11 February 1974 to further LOGC's number one project objective of improving repair parts support to the Army.

3. PURPOSE. The purpose of this study is to identify the extent to which stockouts of mission essential repair parts for selected end items of equipment, at the DSU level, are affecting materiel readiness; and to recommend procedures to minimize stockouts. For the purposes of this study the term "stockout" is defined as a zero balance of an authorized stockage list (ASL) or nonstockage list (NSL) repair part, and the term "mission essential repair part" is defined as a part the lack of which will result in an end item of equipment being deadlined and unable to perform its combat function.

4. OBJECTIVES. The objectives of this study are to:

- a. Verify that there is a problem with repair parts requisitions not being filled due to stockouts at the DSU level.
- b. Determine the reasons for stockouts.
- c. Develop recommendations to reduce repair parts stockouts.

5. ASSUMPTIONS.

a. The current state of knowledge as to the mission essentiality of repair parts is considered adequate for the purposes of this study.

b. For all practical purposes Not Operationally Ready, Supply (NORS) requirements can be considered as being mission essential.

c. The current supply system is basically sound and does not require major changes; however, areas exist where incremental improvements can be made that can be implemented within a year or less, and which will improve system effectiveness.

6. SCOPE. This study was limited to peacetime operations in the Continental United States (CONUS). Four CONUS divisions were used as the data base, the 82d Airborne Division at Fort Bragg, the 101st Airborne Division (Air Assault) at Fort Campbell, and the 1st Cavalry and 2d Armored Divisions at Fort Hood. Data gathered at the divisions were followed through the supporting installation supply officer and the appropriate Army Materiel Command (AMC) commodity command. AMC Missile Command (MICOM), Defense Supply Agency (DSA), and General Services Administration (GSA) activities were not included in the study.

7. METHODOLOGY.

a. One of the major considerations of the study was to limit the effort to mission essential repair parts. For this reason only NORS requisitions were considered.

b. The procedure followed was to collect a random sample of calendar year 1973 and early 1974 priority 02 and 03 requisitions from the four sample divisions. Following this, the stock numbers in the sample were matched with the Army Master Data File to obtain the weapons system code. An end item sample was then selected and only the repair parts for the selected end items were used throughout the study, with two exceptions. Stock numbers from the repair parts sample not identified with the end item sample were used at the US Army Troop Support Command (TROSCOM) and stock numbers provided by the Transportation School were used at the US Army Electronics Command (ECOM). Requisition data were traced from the DSU to the appropriate AMC commodity command to obtain processing times, status, and status dates.

c. Data and other information were obtained from machine produced reports or records when possible and manually when necessary. Statistical tests of hypothesis were used where appropriate.

d. Considerable use was made of personnel interviews. When possible the results of these discussions were supported by local reports or other written documentation.

e. A questionnaire was used to provide the basis of analysis in one case, the subject of training of Prescribed Load List (PLL) Clerks.

## CHAPTER 2

## DISCUSSION

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Section I. Retail Level

## 1. REQUISITION DATA COLLECTION.

a. General. During the period 4 March 74 through 20 March 74, the Quartermaster School study team visited four CONUS divisions and collected data concerning class IX supply operations. The primary purpose of the visits was to collect a sample of class IX Not Operationally Ready Supply (NORS) requisitions to determine if a problem existed in supplying essential repair parts and to provide a basis for the selection of a list of end items to be used throughout the study. NORS data were used for two reasons: first, by definition, a NORS requisition is for a part which is deadlining an end item; and secondly, since NORS requisitions can only be used on systems which have weapons system codes assigned, this technique made it possible to identify the weapons system for which the parts applied.

b. Summary of Sample Results.

(1) The NORS sample gathered from the four divisions was obtained from the maintenance battalion Technical Supply Office document registers for two divisions and from machine records for the other two divisions which did not maintain manual document registers. The data consisted of calendar year 1973 and early 1974 priority 02 and 03 NORS requisitions. The majority of requisitions were priority 03; only one of the four divisions used priority 02.

(2) Figure 1 is a summary of the divisional NORS data collection effort. The total sample consisted of 7,208 requisitions; of these, 56 percent were completed actions, i.e., the part was requisitioned and received by the division; 33 percent were open transactions, i.e., the part was requisitioned but not received as of the date the sample was taken; and 11 percent were canceled, i.e., a request for cancellation had been submitted by the unit. The grouping of data by completed, open, and canceled requisitions was found to be useful and is used in many instances throughout this report.

TOTAL REQUISITIONS		7208	
COMPLETED	4041	(56%)	
OPEN	2371	(33%)	
CANCELED	796	(11%)	
NO MATCHES WITH AMDF		423	(6%)
COMPLETED	162		
OPEN	110		
CANCELED	151		
DSA/GSA		2353	(33%)
COMPLETED	1410		
OPEN	764		
CANCELED	179		

Figure 1. Summary of NORS requisition data.

(3) A program was written by personnel of the Logistics Center (LOGC) to match the sample stock numbers with the Army Master Data File (AMDF) to extract from the AMDF the weapons system code, source of supply, and unit price. Six percent of the sample did not match the AMDF. A sample of those stock numbers which did not match the current AMDF was checked with the AMDF which was current at the time the requisitions were submitted. The principal reason found for the no-match situation was stock number changes. The March 1974 AMDF was used for the stock number match and many of the sample requisitions were initiated in calendar year 1973.

(4) It is significant that 33 percent of the sample were for parts supplied by the Defense Supply Agency (DSA), or General Services Administration (GSA). This would, at first glance, indicate the need to include DSA activities within the scope of the study. However, it was found, after the end item sample was selected, that only 32 parts for the selected sample end items were supplied by non-Army sources. The selection of the end item sample is discussed later in this section.



c. Order and Shipping Times for Division NORS Requisitions.

(1) Figure 2 is a summary of the order and shipping times (OST) by division for parts which were on the authorized stockage lists of the divisions. The weighted mean time for the four divisions was 34.9 days. These data include requisitions that were filled by either the supporting installation or the wholesale supply system. OST's are excessive when compared with the AR 725-50 standard for priority 02 and 03 requisitions, which is 7 days for CONUS.

(2) Figure 3 is in the same format as figure 2. Figure 3, however, summarizes OST data for requisitions which were non-stockage list (NSL) items to the divisions.

UNIT	NO. OF REQUISITIONS	MEAN TIME (DAYS)	RANGE (DAYS)
DIV A	485	25.6	1-171
DIV B	434	44.0	1-230
DIV C	418	45.2	6-286
DIV D	634	29.2	3-170
AVERAGE TIME FOR 4 DIVISIONS = 34.9 DAYS			

Figure 2. Order and shipping times for divisional ASL NORS requisitions.

UNIT	NO. OF REQUISITIONS	MEAN TIME (DAYS)	RANGE (DAYS)
DIV A	490	28.5	1-176
DIV B	628	38.9	1-235
DIV C	647	48.8	1-310
DIV D	209	41.1	9-193
AVERAGE TIME FOR 4 DIVISIONS = 39.8 DAYS			

Figure 3. Order and shipping times for divisional NSL NORS requisitions.

1. Department of the Army Regulation 725-50, Issue of Supplies and Equipment; Requisitioning, Receipt, and Issue System, June 1974, Table 2-2, Chart 2, page 2-11.

The weighted mean OST for NSL parts was 39.8 days, as compared with 34.9 days for authorized stockage list (ASL) items. This difference is smaller than expected and indicates that whether a part is ASL or NSL at the division level has little effect on how fast the unit can expect to receive the part.

d. Selection of Sample End Items.

(1) In order to identify end items, the sample stock numbers were matched with the AMDF to identify weapons system codes. The repair parts sample consisted of requisitions for 117 weapons systems; however, the majority of the weapons systems have very few requisitions, many having less than five.

(2) The choice of end items for study purposes was based upon the volume of NORS requisitions by weapons system. Systems with 50 or more requisitions were chosen, with the exception of the M109 155mm Howitzer which had a total of 46 requisitions. The choice of 50 requisitions as a cut-off was selected because it was felt that OST computations would not be valid if a sample size of much less than 50 was used.

(3) Figure 4 lists the sample end items that were selected. Figure 4 also shows the total number of requisitions for each item, i.e., completed, open, and cancelled requisitions; and the number of requisitions and the mean OST's for both the division ASL and NSL completed transactions. All of the OST's are excessive when compared to the AR 725-50 standard. It is also interesting to note that for 3 of the 14 end items, OST was less for NSL items than it was for ASL items.

(4) Data for the open requisitions which apply to the sample end items are shown in figure 5. The number of open requisitions and the mean time (from the document date to the date the sample was taken) that the requisitions had been open is shown by end item. There is a great deal of variance in these times but it is obvious that many requisitions had been outstanding for a considerable period of time. The reasons for this situation were not discovered until data were gathered from the appropriate National Inventory Control Points (NICP's). The subject will be discussed in detail in Section II of this chapter.

(5) Data for the canceled requisitions for the sample end items are shown in figure 6. The number of canceled requisitions and the mean time from the document date to the request for cancellation date are shown for each item. The volume of cancellations for the selected sample does not appear significant except for the ARAAV, M551. The subject of cancellations is pursued in some detail later in this section due to the fact that 11 percent of the total repair parts sample consisted of

END ITEM	TOTAL NO. OF REQUISITIONS	COMPLETED REQUISITIONS			
		ASL		NSL	
		NO.	DAYS	NO.	DAYS
HEL, UH-1	1029	384	30	359	45
ENGINE, UH-1	156	71	27	65	23
HEL, AH-1G	145	74	27	43	33
HEL, OH-58	126	57	35	47	24
HEL, CH-47	62	17	39	10	60
HOW, M109	46	17	37	8	54
ARAAV, M551	348	45	42	79	57
APC, M113	222	32	39	57	64
GUN, SP, M107, M110	130	18	39	6	62
TANK, M60A1	87	5	47	29	62
TRK, 1 1/4 TON, M561	84	11	80	32	60
HOW, M108	72	10	25	21	150
TRK, 2 1/2 TON	66	8	38	13	39
GUN, AA, M163	134	21	26	42	34

Figure 4. Sample end items and order and shipping times for completed requisitions.

END ITEM	TOTAL NO. OF REQUISITIONS	OPEN REQUISITIONS			
		ASL		NSL	
		NO.	DAYS	NO.	DAYS
HEL, UH-1	1029	150	54	61	108
ENGINE, UH-1	156	10	122	10	111
HEL, AH-1G	145	17	70	6	62
HEL, OH-58	126	10	108	8	236
HEL, CH-47	62	27	61	8	95
HOW, M109	46	14	71	4	81
ARAAV, M551	348	104	119	49	137
APC, M113	222	53	89	60	84
GUN, SP, M107, M110	130	80	48	17	76
TANK, M60A1	87	18	66	34	70
TRK, 1 1/4 TON, M551	84	26	99	10	124
HOW, M108	72	18	90	19	93
TRK, 2 1/2 TON	66	6	91	36	61
GUN, AA,	134	22	143	41	96

Figure 5. Sample end items and open requisition data.

END ITEM	TOTAL NO. OF REQUISITIONS	CANCELED REQUISITIONS			
		ASL		NSL	
		NO.	DAYS	NO.	DAYS
HEL, UH-1	1029	22	25	53	39
ENGINE, UH-1	156	0	na	0	na
HEL, AH-1G	145	3	16	2	5
HEL, OH-58	126	3	41	1	32
HEL, CH-47	62	0	na	0	na
HOW, M109	46	2	25	1	26
ARAAV, M551	348	31	59	40	62
APC, M113	222	12	38	8	56
GUN, SP, M107, M110	130	6	75	3	51
TANK, M60A1	87	1	84	0	na
TRK, 1 1/4 TON, M561	84	1	34	4	113
HOW, M108	72	3	112	1	45
TRK, 2 1/2 TON	66	0	na	3	82
GUN, AA, M163	134	3	47	5	57

Figure 6. Sample end items and canceled requisition data.

canceled requisitions. The volume of cancellations and the time taken before a cancellation request was submitted dictated that problems existed in this area.

(6) All of the data presented thus far have been in terms of numbers of requisitions. The number of different stock numbers involved is considerably less. Figure 7 lists the numbers of stock numbers and requisitions for each item in the end item sample. This type of analysis was not made for the entire repair parts sample since only the requisitions for the selected end items were followed through the supply system.

End Item	Total No. of Requisitions	Number of Federal Stock Nos.
HEL, UH-1	1029	540
ENGINE, UH-1	156	77
HEL, AH-1G	145	120
HEL, OH-58	126	98
HEL, CH-47	62	56
HOW, M109	46	35
ARAAV, M551	348	242
APC, M113	222	132
GUN, SP, M107, M110	130	110
TANK, M60A1	87	54
TRK, 1 1/4 TON, M561	84	50
HOW, M108	72	45
TRK, 2 1/2 TON	66	39
GUN, AA, M163	134	96

Figure 7. Comparison of number of stock numbers and number of requisitions for selected sample end items.

## 2. SUPPLY PERFORMANCE.

### a. Divisions.

(1) Supply performance data were obtained from each of the four sample CONUS divisions, primarily to determine if the zero balance problem was of sufficient magnitude to warrant continuation of the study. Figure 8 is a summary of these data for the four divisions. Figure 9 provides information for each division.

PERFORMANCE MEASURE	MEAN	RANGE	AR 710-2 STANDARD
ASL LINES	7335	5250-10608	5000 <sup>a</sup>
FRINGE LINES	3033	1676-5103	na
DEMAND ACCOMMODATION	69%	68-71%	75-85% <sup>b</sup>
DEMAND SATISFACTION	58%	50-64%	70-80% <sup>b</sup>
ASL ZERO BALANCE	24%	15-36%	na
ASL ZERO BALANCE W/DUES OUT	5%	3-8%	0-5% <sup>c</sup>

Figure 8. Summary of division class IX supply performance. Four CONUS divisions as of Feb 74.

#### NOTES:

a. Department of the Army Regulation 710-2, Change 2, Inventory Management, Materiel Management for Using Units, Support Units, and Installations, 3 June 1974, paragraph 3-27(3), page 3-12.

b. Ibid., page 7-1.

c. Ibid., page 7-4.

PERFORMANCE MEASURE	DIV A	DIV B	DIV C	DIV D
ASL LINES	5250	10608	6711	6772
FRINGE LINES	1676	3589	5103	1765
DEMAND ACCOMMODATION	69%	nd	71%	68%
DEMAND SATISFACTION	65%	nd	50%	61%
ZERO BALANCE	23%	36%	15%	21%
ZERO BALANCE W/DUES OUT	3%	nd	nd	8%

Figure 9. Division class IX supply performance as of Feb 74.

(2) In reference to the above charts, demand accommodation and satisfaction data were not available for one division and zero balances with dues out were not available for two of the divisions.

(3) ASL zero balances were considerable, ranging from 15 to 36 percent with a mean of 24 percent. This fact convinced the study team that continuation of the study was justified. However, it was unfortunate that only two of the four divisions maintained statistics in zero balances with dues-out. An ASL zero balance doesn't become a problem until a demand is placed against the stock number; therefore, zero balances with dues-out are the more meaningful statistics.

(4) Additional data were obtained to verify the extent of the zero balance problem. A copy of the February 1974 US Army, Europe (USAREUR), Report of Supply Activity is attached as appendix A. This report substantiates that zero balances are a general problem, in that the statistics for USAREUR are similar to the situation found in the CONUS divisions.

(5) In addition to zero balance statistics, Figure 8 reveals that none of the divisions sampled met AR 710-2 standards for ASL size, demand accommodation, and demand satisfaction. All of these factors are a function of stockage criteria and, with the exception of ASL lines, cannot be controlled independently. The number of ASL lines can be controlled by relaxing or restricting addition/deletion criteria. AR 710-2 states that a more restrictive stockage criteria will be used to



meet ASL goals (5,000 line objective, with a management range of 4,000-6,000 lines for a maintenance battalion).

(6) The 5,000 line objective is a questionable standard from two standpoints. First, the number of ASL lines is not an independent factor but rather a function of stockage policy; therefore, if the number of ASL lines is an important consideration, it should logically be controlled by adjusting stockage criteria. The effects on demand accommodation and satisfaction must also be considered, since these measures are also functions of stockage policy. It appears from the data presented in figure 8 that if the 5,000-line ASL criteria had been followed, demand accommodation and satisfaction would have been worse than they were. Secondly, the 5,000 line objective does not consider the differences in the types and density of equipment of the various types of divisions. It is logical, and our study confirmed, that an airborne division has a smaller ASL than an air-mobile or armored division.

(7) The subject of ASL size has a direct bearing on mobility, and this factor is important, particularly for a divisional unit. However, restricting ASL size may have an adverse effect on supply performance and this should be considered when establishing ASL size and supply performance standards.

(8) Inventory theory, specifically the effects of various stockage and retention criteria policies, was not addressed in this study. A number of studies have been conducted on this subject in the past. In addition, a DOD level effort is currently underway to establish retail level stockage policy for secondary items (RIMSTOC). Currently units using the Division Logistics System (DLOGS) are using an addition criterion of six demands in 360 days to stock an item and a deletion criteria of three demands in 360 days. One division had obtained an exception to policy and was using criteria of three demands to stock and one to retain for aircraft and missile parts. Units using the Combat Service Support System (CS3) were using variable stockage criteria which is a feature of the CS3 system.

(9) The study team was interested in determining if the provisions of AR 710-2 which address the subject of variable order ship time were being implemented in the field.<sup>2</sup> It was determined that they were for CS3 units, but not for DLOGS units.

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2. See AR 710-2, page 3-14 for a discussion of computational procedures for variable order ship times.

It was found that no program was available for the UNIVAC 1005 system to handle variable order ship time computations. The Quartermaster School submitted a Systems Change Request (SCR) on 10 May 74 to correct this situation. See appendix B.

**b. Installations.**

(1) Installation supply performance data, similar to the data gathered from the four divisions, were obtained from the installation supply office at the installations visited. These data are shown in Figure 10.

PERFORMANCE MEASURE	INSTL A	INSTL B	INSTL C
ASL	11,756	16,071	26,173
ZERO BALANCE	20%	16.6%	23%
DEMAND ACCOMMODATION	nd	59%	73%
DEMAND SATISFACTION	nd	61%	45%
CANCELLATIONS (% OF TOTAL REQUISITIONS PROCESSED)	nd	2%	3.7%

Figure 10. Installation supply performance,  
Three CONUS installations, as of Feb 74.

The items listed as nd, no data, were not available because the study team's contact at installation A felt that the data he had were unreliable.

(2) There is little that can be deduced from such a small sample, except that division and installation supply performance is similar. Zero balances in particular are close; the installations average 19.5 percent and the divisions, 24 percent.

**3. REQUISITION PROCESSING DELAYS.**

a. The study team had intended to follow the sample requisitions through the supporting installation supply offices to identify delays, if any, that occurred at that level. The timing of the study was unfortunate in that two of the three installations visited were in the process of converting from the Base Operating Information System (BASOPS) to the Standard Army Intermediate Level Supply System (SAILS) program. The majority of the

sample requisitions were not currently active and it was determined that it would be necessary to manually research BASOPS document registers to obtain the data desired. Neither time nor personnel were available to conduct this type of research.

b. Information was obtained from other sources, however, which indicate that problems exist in document processing and reconciliation of requisitions. Several examples are discussed in the following paragraphs:

(1) Fort Riley received estimated delivery dates from the US Army Aviation Systems Command (AVSCOM) 6 to 14 months in the future. These dates are unsatisfactory for NORS requisitions. A random sampling of 10 NORS requisitions forwarded to AVSCOM revealed that AVSCOM had recent information for only two requisitions. Eight requisitions were recorded in the history file, but no data could be obtained other than that the requisitions were closed. The two requisitions for which data were available indicated the following:

(a) Twenty-two days delay from the date the unit initiated the requisition until receipt at AVSCOM.

(b) Twenty-three days delay from the date the material was received on post, Fort Riley, until the material was received by the unit.<sup>3</sup>

(2) A local analysis, at Fort Riley, of NORS order ship times for the AH-1G helicopter revealed that an average of 24 days was required from the time the unit requisition was submitted until the part was received.<sup>4</sup>

(3) A liaison visit to the 1st Cavalry Division, Ft. Hood, Texas on 13-17 May 1974 was conducted by the US Army Tank-Automotive Command (USATACOM) to identify and resolve problems pertaining to logistics support. The conversion to SAILS had created significant problems. The visit resulted in a discussion which stated "regardless of what other reports might indicate, the SAILS System at Ft. Hood is not yet working smoothly."<sup>5</sup> The post computer had only one completed cycle dur-

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3. Letter, SAVPS-TO, USAVSCOM, 30 January 1974, subject: Report of Maintenance and Supply Assistance Visit to Ft. Riley, Kansas, paragraph 4, page 2.

4. Message, AFZNDS, 1st Infantry Division, 23 January 1974, subject: AH-1G Availability, paragraph 1, page 1.

5. Travel Memorandum for Record, AMCPM-HT, USAMC, 20 May 74, subject: Liaison Visit to 1st Cavalry Division, Ft. Hood, Texas, 13-17 May 1974, paragraph 4, page 1.

ing May 74 and a transaction backlog of 106,946 existed. The division recently reconciled 18,000 requisitions with post and post had no record of 8,000 (44%) of these requisitions.<sup>6</sup> Approximately 11 percent of the division's tactical vehicles and 19 percent of the combat vehicles were not operationally ready.<sup>7</sup> These gross figures are somewhat misleading in that most of the repair parts requisitions were fairly recent and the system had not had time to react.

(4) A liaison visit was conducted by AVSCOM to Ft Sill, Oklahoma, to analyze, assist, and resolve, where possible, the current aviation supply problems at that installation. The following observations were made:

(a) Fort Sill received estimated delivery dates 6 to 14 months in the future. These were unsatisfactory for NORS requisitions.<sup>8</sup>

(b) "When the estimated delivery dates expired, a followup is taken and they continue to receive expired estimated delivery dates."<sup>9</sup>

(c) Current printouts for 75 NORS requisitions revealed that 25 items were on backorder, 42 had been shipped or ordered shipped, and the remainder were canceled, rejected, being procured for direct shipment, or had no record.<sup>10</sup> Fifty of the 75 requisitions had status other than backorder. This status had been transcribed by AVSCOM, but took from 7 to 12 days to reach Fort Sill.<sup>11</sup>

(5) Figures 11 and 12 summarize the results of research conducted by the Army Materiel Command on requisitions from two nondivisional repair parts companies at one CONUS installation. Analysis of the dues-in indicated that many of the requisitions shown as valid at the unit level had either been shipped, canceled, or were not valid for other reasons at the wholesale level. About 80 percent of the requisitions reflected as working at the companies were not working at the NICP's. The remaining 20 percent were scheduled for delivery during the next 90 days. Similar conditions existed for DSA and GSA items.

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6. Ibid., pages 1-2.

7. Ibid., page 3.

8. Letter, SAVFS-TC, USAAVSCOM, 26 September 1973, subject: Report of Maintenance and Supply Assistance Visit to Fort Sill, Oklahoma, paragraph 4b(1), page 2.

9. Ibid., paragraph 4b(2), page 2.

10. Ibid., paragraph 4a, page 2.

11. Ibid., paragraph 4b(3), page 2.

Status after Research by AMC NICPs	Number of Requisitions
Canceled/Rejected	69
Previously Shipped	129
Passed to another Supply Source	26
No Record of Requisition	240
Unsatisfied (valid due-out from NICPs)	114
Total shown as due-in by the units	578

Figure 11. Results of research of 578 requisitions  
by AMC NICPs.

SOURCE: Letter, AMCSU-KC, USAMC, 12 June 1974, Inclosure 1.

Status after Research by LCO LIF*	Number of Requisitions
Cancelled/Rejected	16
Previously Shipped	60
No Record of Requisition	182
Unsatisfied (valid due-in)	26
Total shown as due-in by the units	284

Figure 12. Results of research of 284  
DSA/GSA requisitions.

\*LCO - Logistics Control Office; LIF - Logistics Intelligence File

SOURCE: Letter, AMCSU-KC, USAMC, 12 June 1974, Inclosure 1.

(6) An in-depth review of the M551 vehicle was made by AMC, at Fort Carson, during the period 13-17 August 1973. The purpose of the study was to review all aspects of M551 activity to determine why the vehicle was consistently below the established readiness goal. Results indicated that a reconciliation of records between the DSU and NICP was required, and that attention is required to assure that there is a proper interface between the wholesale and retail levels of supply, particularly in the areas of catalog, technical, and master data file records. The same can be said between the activities on post.

(7) Raw supply data (unsatisfied repair part requirements reflected in vehicle log books, and items needed to complete open job orders) were traced from the unit, through the DSU, and the installation supply division. The results are shown in Figure 13.

Status of Requests	Number of Requests
Canceled	26
No record	146
Issued	47
Valid Unsatisfied Requirements	85
Total Unsatisfied Requirements	304

Figure 13. Fort Carson M551 requests.

SOURCE: Travel Memorandum for Record, AMCLA, USAMC, 11 September 1973, subject: Review of M551 Armored Reconnaissance Airborne Assault Vehicle Activity at US Army Tank-Automotive Command (TACOM), Warren, Michigan 48090, 28-31 August 1973, Inclosure 3, page 1.

The above statistics strongly indicate a problem of requisition processing and/or record keeping. No record existed at the DSU or installation for nearly 50 percent of the units' requests.

(8) Sixty-two of the 85 items shown in figure 13 as valid unsatisfied requirements were TACOM managed items. These requisitions were traced at the NICP to determine their current status. The results are shown in figure 14.

Status	Number of Requisitions
Shipped	12
In process for release	3
No record of receipt	6
Canceled	2
Backordered	39
Total	62

Figure 14. Analysis of TACOM managed M551 parts from Ft. Carson.

SOURCE: HQ, US Army Materiel Command, AMCLA, op. cit., inclosure 3, page 2.

At the unit and installation level it was noted that the biggest problem was requisitions with no record. This problem was less severe at the wholesale level (approximately 10 percent of the requisitions researched). The major problem with the TACOM items was zero balances (62 percent of the valid requisitions were on back order).

(9) The above examples illustrate that a problem exists in document processing, not only for requisitions, but also for receipts and cancellations. The extent of the problem is not known. It would not be valid to generalize from the data gathered to date. The indications are, however, that we have a problem of getting information from point A to point B. This area deserves further analysis to determine the extent of the problem, where the breakdowns occur, and the corrective action that is needed. This subject was discussed at the 22 August 1974 repair parts study In Process Review (IPR) and it was decided that further study of the processing problem should be postponed until spring of 1975. This decision was reached primarily because of the on-going SAILS conversions at CONUS installations. Unexpected and nonrecurring problems can be expected during a systems change. In addition, a bottoms-up reconciliation program is to be added to the SAILS problem which should eliminate, or reduce, the magnitude of the problems previously discussed.

#### 4. PHYSICAL INVENTORY PROCEDURES.

##### a. Results of Sample Inventory.

(1) Zero balances can be real, or the result of accounting errors. For this reason, the study team conducted a sample inventory at each division visited to determine if inventory accuracy was within the acceptable standard of 90 percent.<sup>12</sup> One hundred class IX lines were inventoried at each division. The items were selected on a random basis and half were checked from the records to the bins and half from the bins to the records. The total sample size was 371, rather than 400, due to the fact that there were some lines which, for a variety of reasons, could not be reconciled to the satisfaction of the study team and/or division personnel. These lines were deleted from the sample. The results of the inventory are shown in figure 15.

Category	Lines	% of Sample	Percentage Range
Matches	163	43.9	21-67
Overages	112	30.2	25-36
Shortages	96	25.9	8-43
Totals	371	100.0	na

Figure 15. Results of sample inventory of Class IX items at four CONUS divisions.

(2) Figure 15 is a consolidation of the data for the four divisions. Only 43.9 percent of the lines inventoried actually matched the recorded balances after reconciliation, with a range, by division, from 21 percent to 67 percent. None of the divisions was even close to the AR 710-2 standard of 90 percent.

(3) The percentage ranges in figure 15 for overages and shortages were based on the number of lines over or short. On a percentage basis overage errors exceeded shortage errors, although the ranges by division do not confirm this conclusion.

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12. AR 710-2, op. cit., page 7-3.



(4) In order to get a better idea as to the magnitude of the inventory errors, and whether the errors tended to be in one direction or the other, a comparison of overages and shortages was computed using the quantity over or short as a percentage of the recorded balance. Absolute inventory accuracy is extremely difficult to achieve; however, if the percentage error between recorded and on hand balances is small the situation is not particularly serious. Unfortunately, this was not the case. The percentage errors were quite large, as shown by figure 16.

Category	Number of Lines	Error Percentage	Percentage Range
Overages	112	152%	61-206
Shortages	96	54%	61-66

Figure 16. Inventory errors as a percentage of recorded balances.

There appears to be a tendency when we make errors to err on the side of creating excess. This is really not that important. What is important is the magnitude of the errors, both overages and shortages.

(5) A subject closely related to inventory accuracy is that of inventory adjustments. If adjustments are small, we can assume a high level of inventory accuracy and vice versa. Figure 17 shows the results of an analysis of the monthly inventory adjustment reports for two of the four sample divisions. These data were not available to the study team for the other two divisions.

Unit	Approximate Value of Inventory	Cumulative Annual Adjustments		Adjustments As Percentage of Inventory
		Overages	Shortages	
Div A	\$847,792	\$537,661	\$269,150	95.2%
Div C	\$1,712,705	\$1,653,544	\$3,559,036	304.3%

Figure 17. Division inventory adjustments.

Figure 17 confirms the seriousness of the problem. The acceptable range for gross inventory adjustments is 0 to 19.99 percent.<sup>13</sup>

b. Extent of the Inventory Accuracy Problem.

(1) There is a fallacy in using information from four divisions and making statements about the entire Army, however, in the area of inventories this extension can probably be made with some assurance of accuracy. The reason is that, in addition to this study, previous studies have identified this problem at various levels of the supply system. Several examples are given below.

(2) Research Analysis Corporation conducted a study of the repair parts supply system in 1968. Included in this study was a lengthy discussion of physical inventory procedures. Extracts from this report are presented in the following paragraphs:

(a) COMZEUR (Communications Zone, Europe) units are currently using statistical procedures for conducting inventories. The conversion from the procedure of 100 percent inventory was made in January 1966; however, prior to the conversion a 100 percent wall-to-wall inventory was conducted for the purpose of updating records. The wall-to-wall inventory took COMZEUR three months to complete. As of June 1966 all major discrepancies had still not been resolved. Shown in figure 18 are the results of that inventory for COMZEUR's two major depots, Kaiserslautern and Nancy, and the overall results for all depots. Excluding only those discrepancies in excess of 10 percent or \$100, the

Discrepancies	Kaiserslautern		Nancy		Grand Total, All Depots	
	Number	Percent	Number	Percent	Number	Percent
None	110,041	70	92,573	63	469,556	69.2
Minor	7,189	5	10,508	7	30,236	4.5
Major	38,094	25	43,330	30	178,732	26.3
Total	155,324	100	146,411	100	678,524	100

Figure 18. COMZEUR: 100 percent inventory.

SOURCE: Ibid., page 55.

13. AR 710-2, op. cit., page 7-3.

overall accuracy is noted to be approximately 74 percent.<sup>14</sup>

(b) Sample inventories conducted at the NICP level at three different Army depots revealed accuracy levels of 44.5, 76.2, and 86.7 percent. The low accuracy level of 44.5 percent is primarily due to the fact that there has not been a formal 100 percent or sampling-type inventory in over a year's time. The only inventory being done at this arsenal is for items that have gone to zero balance or have caused a warehouse denial.<sup>15</sup>

(3) The following statement is contained in a 1971 Government Accounting Office (GAO) report:

To make sound decisions on the allocation of Federal resources, the Congress and Federal administrators must have timely and accurate data. Data on inventory levels is an example. If the information is incorrect, funds may be used for unneeded supplies at the expense of other defense programs, or funds could be incorrectly diverted from the supply area with resulting impairment of the Nation's readiness position.<sup>16</sup>

The GAO report states that in FY 1970 CONUS Army inventories grew to \$3 billion and the adjustment ratio was 27.7 percent. For the Army in the field the inventory discrepancies were even more astounding. The report mentions that Europe adjusted its records by \$643 million or 58 percent of the average inventory of 1.1 billion. Furthermore, records were adjusted a second time in the same year due to special inventories. The amount of the adjustment was a staggering \$773 million. This boosted total adjustments to 1.4 billion, which exceeded the average inventory value by .1 billion.<sup>17</sup> With massive inventory adjustments as this, one wonders why records were kept at all.

c. Correct Physical Inventory Procedures.

(1) Inventory adjustments consist of overages and shortages. Too often the first reaction is to overlook the

14. Research Analysis Corporation, An Analysis of the Army Repair Parts Supply System, August 1968, page 55.

15. Ibid., page 56.

16. Controller General of the United States, Report to Congress: Army Inventories -- Inaccuracies, Effects, and Ways to Improve, February 1971, page 1.

17. Ibid., page 17.

overages and concentrate on the shortages. Thus ensues a peculiar chain of events which could be called the "strengthen physical security syndrom." After all, isn't pilferage the obvious reason for inventory shortages? This is probably the correct answer if shortages are the only inventory adjustments. However, if there are overages and shortages, this may be indicative of a lack of coordination between document accounting flows and physical commodity flows. Both flows must be synchronized and frozen before the conduct of a physical inventory. This calls for accurate shipping and receiving cutoffs. With the advent of computerized stock control and an increased number of lines to manage, accurate cutoffs require detailed planning and coordinated information feedback among the shipping, receiving, storage, and stock accounting sections. Absence of planning and feedback often results in massive overage and shortage adjustments.

(2) In most cases, the posting of receipts lags behind actual placement into storage locations. If an inventory were to be conducted within this time interval, an overage would be noted. This is one reason why "rush" inventories often do more harm than good. Time must be taken to reconcile count quantities to unposted receipts.

(3) In some instances the lag in receipt processing may be reversed, i.e., stock records may be posted before stock is physically moved to the warehouse. This normally happens when receiving sections are backlogged. Under these circumstances, inventory counts may reveal shortages.

(4) Since material release orders reduce stock record on-hand balances before physical movement of stock to the shipping section, inventory counts during this time lag will reveal overages. Of course, if the overages are posted as gains, sooner or later material release denials appear.

(5) In order to perform accurate physical inventories, both commodity and document flows must be synchronized at the same point in time and then frozen until counts are made and records are posted. This is done by selecting in advance an exact date for the receiving and shipping cutoffs. All receipts prior to this date will be placed into location and corresponding document posted to stock records. For shipping cutoffs, material release orders are stopped on the cutoff date. All outstanding material release orders must be identified and/or processed by moving stock to the shipping section. If for some reason the stock cannot be physically moved to the shipping area, inventory counts must be adjusted downward by the amount of the unprocessed material release orders. This is often the procedure for bulk items such as lumber, cement, and fortification

material, since it is more economical to load a customer's shipment from the storage location than to move the stock to a shipping area for loading. One last precaution for accurate cutoffs is to issue explicit instructions to the count teams to not count items in the shipping and receiving sections.

(6) To compound the difficulty of achieving accurate cutoffs, current regulations provide for the processing of requests with priority designators 01-08 during an inventory. Special instructions to inventory count teams must be given as follows:

(a) If the item has already been counted, subtract the amount of the issue from the count quantity.

(b) If the item has not been counted, continue normal processing.

(7) The above procedure requires some means of identifying those items which have been inventoried and those which have not. This leads us into one more aspect of inventory procedures.

(8) Accurate physical inventories also imply "complete" physical inventories which require some method to insure that all stocks have been counted. Too often, counts are made only for items which have stock records. There must be some way of identifying items on hand which are not included in the stock records files. This can be done by placing count cards conspicuously upon each location. The inventory supervisor can then insure that each item bears a count card. For those items which do not have count cards, a serial numbered card can be prepared. Before the count cards are pulled, the supervisor can spot check the validity of recorded counts. After spot checking inventory counts and insuring that all items bear a count card, the cards can be pulled and accounted for by serial number.

d. Corrective Actions. The most important factors needed to correct inventory procedures are increased interest, planning, and supervision. However, it was found from a literature search that current guidance on the subject of physical inventories is scattered among numerous publications (see figure 19) and that none explains the complete detailed procedure required to conduct an accurate inventory and reconciliation. As a result of this observation the Quartermaster School is preparing detailed guidance on the subject. It is planned, at the present time, that this information will be published separately as a training circular. The training circular will for the basis to initiate changes to applicable regulations.

Reference	Title	Sub-para/Title	Proponent Agency	Remarks HQ DA May 73
AR 740-1 23 Apr 71 Change 1	Storage and Supply Activity	Ch 7, Physical Inventory Control	US Army Materiel Command, AMCSU-BS	Chapter 7 is listed "TO BE PUBLISHED" since 23 Apr 71 - C2 dated 6 Jun 73 indicates same.
AR 735-11 26 May 71	Accounting for Lost, Damaged and Destroyed Property	Para 2-4, Inventory Losses	Office of the Comptroller of the Army, HQ DA (DACA-FIS-L)	Inventory Adj. Procedures
AR 735-5 14 Mar 69 Change 1	Property Accountability	Para 1-13, Inventories of Property	Office of the Comptroller of the Army, COMPT-FA	States requirements for physical inventories.
AR 710-2 1 Aug 71	Materiel Management for Using Units, Support Units, and Installations	Section IX, Inventory and Adjustment Procedures	US Army Logistics Doctrine Systems, & Readiness Agency, LDSRA-LPS	DSU level/org level. Most comprehensive coverage of physical inventory procedures available, but not all inclusive.
AR 740-26 15 Apr 73	Physical Inventory Control	Ch 2, Inventory Procedures	Office of the Deputy Chief of Staff for Logistics, HQ DA (DALO-SMS-R)	For wholesale level. Inadequate coverage.

Figure 19. References for physical inventory procedures  
(continued on next page).

Reference	Title	Sub-para/Title	Proponent Agency	Remarks HQ DA May 73
FM 38-23 19 Jun 69 Change 1	Logistics Management: Supply Operations at the Depot	Ch 15, Inventories	US Army Logistics Management Center	Sketches location survey procedures - inadequate coverage of inventory procedures.
TM 743-200	Storage and Materiel Handling	Ch 3, Section VII Inventory	DCSLOG	Discusses procedures of inventory only.
DA Pam 710 series	Inventory Management Physical Inventory Training	All sections	US Army Materiel Command, AMCSU-BS	Applicable to AMC only. Incomplete coverage.
TM 38-741 (Draft) May 73	DSU Storage Procedures	Ch 4, Inventories	HQ DA	Chapter on Inventory only discusses how to count.

Figure 19. References for physical inventory procedures (concluded).

## 5. CANCELLATIONS.

a. Cancellations and Rejections. A request for cancellation is a notice to the supply system that an item previously requested is no longer needed. A cancellation request will normally originate at the same level which created the demand for the item. At the using unit level the demand is in the form of a request for issue and the cancellation request is simply a notice that the issue should not be made. Technically, only the originator of the demand can cancel that demand. In reality, however, cancellation action does occur at other points in the supply system. At the direct support unit (DSU) the demand is a formal requisition to the next higher source of supply, and the cancellation action takes the form of a request for cancellation since it may be too late to stop shipment of the item. The requesting unit or DSU cannot consider a request for cancellation valid until a confirmation of the request is received. The installation supply office (ISO), or general support unit, may also request cancellation of a requisition. Sources of supply may reject a request or requisition due to incorrect data or improper format. Rejections take the same form as a cancellation in that it stops action. It is different from a cancellation, however, because the need for the item may still exist, AR 710-7 permits rejection of improper requests or requisitions but its primary purpose is to reduce rejections. Only if the originator of the demand initiates the cancellation action can the system be assured that the item is no longer needed. As will be shown in a later discussion of a sample of cancellations, the reasons for cancellation, or rejection, are not always known and the current system does not always clearly designate the agency that initiated the cancellation. For the balance of this section the term cancellation includes rejection.

### b. Volume of Division Cancellations.

(1) Cancellations were not a subject of interest at the beginning of the study; however, the subject became of interest when it was determined that approximately 26 percent of the NORS sample requisitions for two of the four divisions were later canceled. Detailed cancellation data were available for only two divisions since document registers were used as source documents for these divisions.

(2) The data sample for the two divisions totaled 2,014 NORS requisitions; 950 were completed, 746 were open at the time of the sample, and 318 requisitions had been designated as canceled on the document register. These requisitions were later matched to 28 weapons systems or major end items. Data for 13 of the more significant items are shown in figure 20.



WEAPON	TOTAL	COMPLETED	CANCELED	PERCENT CANCELED
M107	23	14	9	39.1
M551	186	115	71	38.0
2 1/2 Ton Trk	8	5	3	37.5
M108	14	9	5	35.7
M114	300	197	103	34.0
M109	7	5	2	28.5
1 1/4 Ton (M561)	19	14	5	26.3
M113A	76	56	20	26.3
UH-1	390	316	74	18.9
XM 163	51	43	8	15.7
M60	7	6	1	14.2
OH-58	36	32	4	11.0
AH-1G	60	55	5	8.3
SUMMARY	1177	867	310	26.3

Figure 20. Percent of NORS requisitions canceled compared with number completed, two CONUS divisions.

(3) Data shown in figure 21 portray cancellations for stocked (ASL) and nonstocked (NSL) requisitions for the two divisions. The cumulative percentage of cancellations in relationship to time is shown in 10-day increments up to 80 days. The data collected ranged from 1 to 170 days; however, as can be seen in figure 21, the percentage over 80 days is small. Based on the data available it can be assumed that division 1 is more prompt in making cancellations.

DAYS	AVERAGE	DIV 1		DIV 2	
		ASL	NSL	ASL	NSL
10	23.60	31.6	19.3	16.8	26.7
20	39.95	54.4	44.1	27.9	33.4
30	49.58	62.0	55.9	40.2	40.2
40	64.30	69.6	88.2	50.4	48.7
50	72.80	73.4	91.4	63.4	63.3
60	78.20	78.5	91.4	72.6	70.0
70	85.50	84.8	94.6	89.2	73.6
80	88.60	87.3	94.6	92.5	80.0

Figure 21. Cumulative percent canceled compared to completed NORS requisitions, two CONUS divisions.

(4) The duration of time in the sample is cause for amazement for those who are familiar with expected delivery dates for high priority requisitions, which is 7 days. In a theoretical system there would be little time to request a cancellation of a high priority requisition. The actual average order and shipping time, however, for the requisitions in the two-division sample was 37 days.

c. Additional Cancellation Data Obtained from AMC NICP's.

(1) A more complete picture of the cancellation situation was obtained after status and status dates were obtained from the supporting AMC NICP's. Figures 22, 23, and 24 show the number of days from the document date to shipment status date for those cancellations which were shipped, the number of

Category	ASL	NSL	Weighted Average ASL & NSL
Document Date to Shipment Status (Mean Days)	68.4	70.8	69.7
Document Date To Cancellation Date (Mean Days)	56.1	65.0	60.9
Percent with Shipment Status	28	38	33.4
Percent with No Record Status	47	47	47
Percent Cancellations	23	13	17.6

Figure 22. NORS requisitions submitted to US Army  
Tank Automotive Command (TACOM)  
and subsequently canceled by divisional units.

Category	ASL	NSL	Weighted Average ASL & NSL
Document Date to Shipment Status (Mean Days)	16	37	25.1
Document Date To Cancellation Date (Mean Days)	76.8	21.5	52.8
Percent with Shipment Status	15	20	17.2
Percent with No Record Status	15	30	21.5
Percent Cancellations	69	40	56.4

Figure 23. NORS requisitions submitted  
to the US Army Armament Command (ARMCOM) and subsequently  
canceled by divisional units.

days from the document date until the cancellation date, and percentage by status. These data were computed based upon cancellation data for the sample end items from all four sample divisions and not just the two that were discussed in the previous paragraphs.

Category	ASL	NSL	Average ASL & NSL
Document Date to Shipment Status (Mean Days)	15.5	56.2	43.4
Document Date to Cancellation Date (Mean Days)	30.0	39.6	35.7
Percent with Shipment Status	28.0	28.6	28.3
Percent with No Record Status	28.0	42.8	40.7
Percent Cancellations	36.0	28.6	40.7

Figure 24. NORS requisitions submitted to the US Army Aviation Systems Command (AVSCOM) and subsequently canceled by divisional units.

The preceding data indicate that considerable variance exists from one commodity command to another for each statistic concerning cancellations. The reasons for these differences were not determined.

(2) In order to obtain more representative data, the data presented in figures 22 through 24 were averaged based upon the number of requisitions in each category. Figure 25 presents the consolidated cancellation data for requisitions submitted to TACOM, ARMCOM, and AVSCOM.

Category	ASL	NSL
Document Date to Shipment Status (Mean Days)	45.3	61.6
Document Date to Cancellation Date (Mean Days)	52.1	50.6
Percent with Shipment Status	25.9	32.5
Percent with No Record Status	38.8	43.7
Percent Cancellations	33.9	21.9

Figure 25. NORS requisitions submitted to TACOM, ARMCOM, and AVSCOM; and subsequently canceled by divisional units.

Several interesting observations can be made from the above data:

(a) Considerable time passes from the date a requisition is submitted until the time units submit a request for cancellation (50.6 for NSL to 52.1 days for ASL). Study team inquiries at the NICP's concerning cancellations indicated the probability is high that if an item is in stock, it will be shipped. This is apparently what is happening (25.9 to 32.5 percent of cancellations are shipped). An obvious reason for this situation is the long period of time that passes from the requisition until the request for cancellation. If this time could be reduced, greater opportunity would exist to frustrate shipments.

(b) Shipment of parts for which cancellation has been requested may result in the creation of excesses. For ASL items excess is not created until a quantity of twice the requisitioning objective (RO) is on hand. Theoretically, all receipts for fringe items (NSL) for which cancellation has been requested create excesses.

(c) The large percentage of requisitions with a no record status at the NICP's (38.8 to 43.7 percent) indicate either that these requisitions were canceled before they left the installation or that there are errors in the NICP history file.

(3) Cancellations and rejections comprise a significant volume of priority requisitions in the Direct Support System (DSS) operated by AMC. Considering cancellations and rejections together, they average 9.8 percent of the stockage volume and 13.4 percent of the fringe volume. These percentages are somewhat lower than the average for the commodity commands of AMC because they include cancellations for requisitions to DSA and GSA. The average rate of cancellations for stocked and nonstocked requisitions at the DSS destinations are shown in figure 26. It is significant that Okinawa, Japan, and Thailand are above the average and that Fort Riley is the lowest. It must be emphasized that Fort Riley is the newest member of the DSS system and the data are for October 73 to February 74, while all other destinations have data for a full year, March 73 to February 74.

ASL		NSL	
Location	Percent Cancellations	Location	Percent Cancellations
Okinawa	22.6	Japan	22.0
Japan	13.0	Okinawa	18.8
Thailand	12.0	Thailand	16.9
Ft Bragg	8.3	Hawaii	13.6
Korea	7.3	Korea	11.4
Hawaii	7.3	Europe	11.0
Europe	6.6	Ft Bragg	9.0
Ft Riley	1.5	Ft Riley	4.6
Average	9.8	Average	13.4

Figure 26. Percentage of cancellations in DSS by destination.

SOURCE: HQ, USAMC, Direct Support Supply System Performance Report, 28 February 1974.

(4) Shown in figure 27 are the rates of cancellation in DSS by AMC commodity command. Four of the six commands are above the AMC average in each category. The Tank-Automotive Command has the lowest rate of cancellations.

ASL		NSL	
Command	Percent Cancellations	Command	Percent Cancellations
AVSCOM	15.0	MICOM	21.0
MICOM	14.9	TROSCOM	17.6
TROSCOM	12.5	ECOM	17.4
ARMCOM	12.4	AVSCOM	17.0
ECOM	9.9	ARMCOM	13.0
TACOM	9.4	TACOM	12.6
AMC Average	12.35	AMC Average	16.4

Figure 27. Percentage of cancellations in DSS by AMC Commodity Commands.

SOURCE: HQ, USAMC, Direct Support Supply System Performance Report, 28 February 1974.

It is emphasized that these data report the volume of cancellation requests that were honored. There are no known data, outside that generated by this study, on the volume of requests for cancellations that were submitted too late to stop shipment of the item. It is known that some DSU's delete the due-in before the confirmation of cancellation is received and must record receipts as "receipts not due in."

d. Reasons for Cancellations.

(1) A unit will cancel a request because it no longer needs the item. Since it apparently needed the item earlier, it is necessary to surmise several reasons why the need is no longer valid. There are several sources of repair parts, one of which is the normal supply system. A common practice is to submit a request for the item and then check other sources such as nearby units, cannibalization, fabrication, or a more thorough search of the unit supply bins.

(2) This thought process requires an assumption that the part was actually needed rather than a guess by someone in the maintenance shop before actually inspecting the vehicle to be repaired. There are valid reasons for such a situation when it is necessary to disassemble a component part such as a transmission. If such is the case, the demand should definitely be deleted from the record when it is determined that the item is not required.

(3) Valid demands filled from alternate sources, however, should be reported to the DSU, because the part was needed at the time of request. Everyone seems to understand that "scrounging" is almost a routine source of supply, but there is no formal recognition of a demand filled through scrounging. There should be a cancellation if the unit doesn't need the part, but the DSU should record the demand. AR 710-2 is silent on the point of whether or not the accountable officer should delete the demand data upon cancellation of the requisition.<sup>18</sup> DLOGS, however, does cancel the demand when the requisition is canceled.

(4) Another possible reason for cancellation at the unit level is caused by lack of faith in the supply system. When a request is not filled in a reasonable amount of time the unit may submit a second or possibly a third request for the same item. When the first request is filled, the outstanding requests are canceled. Such practice on the part of a unit causes unnecessary turbulence in the supply system and should be stopped through command emphasis or customer liaison. In defense of the unit, it should be stated that had the supply system been responsive on the initial request, subsequent requests would not have been submitted. This is a valid argument and will probably always stand as a reason why the customer has little faith in the supply system.

(5) The customer is not expected to be a supply expert and will normally have a valid reason for requesting cancellation. The DSU is expected to have more expertise and should not plead ignorance as a cause of cancellations or rejections. Some of the reasons for cancellations at the unit level apply to the DSU for they, too, are known to be scroungers at times. Assume that the part in question was at zero balance at the DSU and that the priority of the request caused a requisition to be created, but the request was filled from other than normal sources. This was a valid demand but the need has been filled. Unfortunately the current system cannot distinguish such a condition, so it is necessary for the NICP to delete the demand when the request for cancellation is granted.

(6) The DSU often received parts from customers as excess turn-in and when this occurs, the existing due-out should be filled. In this case the requisition is not canceled unless the part is not normally stocked. A partial cancellation

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18. AR 710-2, op. cit., page 3-23



is often created due to unexpected receipts as turn-in from customers. The primary reason for this high degree of returns is due to a lack of knowledge of parts that are interchangeable.<sup>19</sup>

(7) Catalog changes contribute to the volume of cancellations at the DSU level. At most installations the divisional or nondivisional maintenance units must submit their requisitions through an ISO for local screening prior to sending the requisition on to the NICP. Quarterly changes to the supply catalog are not always posted at the same time and the editing process may cause rejection of valid requisitions because the catalog being used is not correct. There are occasions when the rejecting activity is incorrect and a valid requisition is returned, causing a delay in the process. Command emphasis and improved supervision can prevent this situation.

(8) Funding constraints may cause cancellation at the installation level if the commander is willing to accept a reduced state of readiness. This should not occur for repair parts since they are normally low in cost and are normally expendable items. Cancellations of this nature normally occur after a reconciliation of dues-in.

(9) Data shown earlier for two of the four sample divisions showed the volume of cancellations. In neither case were the reasons for cancellations indicated on the document registers. In one division the source of the cancellation request was indicated, as follows: 35 percent at the requesting unit, 20 percent at the DSU, 24 percent at the ISO, and 21 percent at the NICP.

e. Supply System Reaction to Cancellations.

(1) When a requesting unit determines it no longer needs an item it has requested, it should immediately cancel that request to prevent excesses at the unit level. Under present procedures there is no explanation given for the cancellation. It will be recommended later in this report that a reason be given to permit a better analysis of the demand at the DSU.

(2) The DSU may take two possible courses of action upon receipt of a cancellation. The first matter of concern

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19. Interview with COL J. F. Senna, HQ USAMC

is whether the item in question is a stocked or fringe item. This determination is critical to whether the DSU submits a request for cancellation to the next higher supply source. In either case the due-out to the requesting unit is deleted from the records. If the item being requisitioned is not normally stocked at the DSU, a request for cancellation is prepared immediately, for it is unlikely that another request for that item is going to be received. If the item is on the ASL, however, the DSU merely cancels the due-out to the unit and permits the requisitioned item to arrive for stockage replenishment.

(3) For purposes of discussion it is assumed that the item in question is a fringe item and that the NICP receives a request for cancellation from the DSU. Supply action is easily stopped if the storage activity or procurement activity has not taken action to fill the requisition. It is possible to frustrate shipments and cancel procurement action but that is not normally done unless the dollar value of the action is significant. When it is possible to stop the action, the NICP will advise the DSU that the cancellation is valid and the DSU does not consider the item as due-in.<sup>20</sup>

f. Summary Discussion.

(1) A review of the volume of cancellations for two of the sample divisions indicated that one of every four high-priority requisitions are later canceled. The rate decreases to 11 percent when the entire sample of 7,208 requisitions is considered. The validity of the 11 percent rate is increased by the fact that the same rate was determined in a Research Analysis Corporation study.<sup>21</sup> On the basis of DSS reports, cancellations average 12.3 percent for ASL items and 16.4 percent for NSL items. In any case, within the range of 11 to 25 percent there is a significant volume of requisitions that are later canceled. The supply system must recognize this volume and attempt to reduce it to the lowest possible level. Cancellations should not be eliminated for there are valid reasons why a requisition should not be filled.

(2) As mentioned earlier, one of the more interesting statistics obtained was the fact that units take a long time to

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20. AR 725-50, op. cit., page 3-35.

21. Research Analysis Corporation, Logistics Performance Measures for Direct and General Support Units, December 1972, page 66.

initiate cancellations (52 days for ASL items, and 50 days for NSL items). If this time could be reduced, a greater opportunity would exist to frustrate shipments.

(3) The current system is oriented toward canceling the requirement but does not record the reason for the action. It would be helpful if AR 725-50 contained codes to identify the canceling activity and the reason for cancellation. This would permit a more realistic analysis of cancellation date to determine weaknesses in the supply system. For example, if a large volume of the cancellations are rejects at the installation level due to bad stock numbers, there is a clear indicator that either the ISO or the DSU have inaccurate catalog data. Under the current system it is very difficult to determine why requests for cancellations are initiated.

#### 6. DSU RECEIPT PROCEDURES.

##### a. Shipment Statistics.

(1) It became obvious to the study team, after the divisional data were gathered, that a considerable number of open requisitions had been open for excessive periods of time. Zero balances at the NICP level are partially responsible for this situation, and this subject will be discussed in section II of this chapter. Another possible cause could be errors in DSU records, i.e., dues-in which have already been received but have not been cleared from the records. A statistical analysis was made to determine if it is probable that this situation exists.

(2) Figure 28 shows shipment data for the completed requisitions in our sample. Of particular interest is the fact that the average time from shipment status to receipt is 18.1 days for ASL items and 18.3 days for NSL items. The standard deviation of shipment times was also computed for the weighted mean of ASL and NSL shipment times and was found to be quite large: 20.34 days.

Category	ASL	NSL
Document Date To Shipment Status (Mean Days)	17.9	36.9
Shipment Status to Receipt by the DSU (Mean Days)	18.1	18.3
Order Ship Time for Requisitions with a Shipment Status	36.0	55.2

Figure 28. Completed division requisitions with shipment status.

(3) Figure 29 depicts selected data for the open requisitions in the repair parts sample.

Category	ASL	NSL
Document Date to Shipment Status (Mean Days)	35.3	48.1
Document Date To Sample Date (Mean Days)	86.5	89.4
Percent with Shipment Status	59.1	59.4

Figure 29. Open requisitions with shipment status

Divisional data collection was accomplished during March 1974, and NICP data collection during May 1974. By that time the majority of the division open requisitions had been shipped (59 percent) either before or after the sample date. However, after the data from the NICP history files were obtained, it was possible to make a statistical analysis of shipment times and open requisitions.

b. Test for Significance of the Difference between Two Means.

(1) Since the exact distribution of shipment times was not known, an assumption was made that the majority of receipts should be cleared from division records within 7 days after the mean shipment time. On this basis, it was found that 34 percent of the open requisitions in the sample which had been shipped 25 days or longer prior to the time the sample was taken had not been cleared from the records at the DSU. This is not surprising, in itself, considering the large standard deviation that existed for shipment times. Further investigation indicated, however, that the distribution of shipment times for all receipts may not be from the same population as the distribution of time for open requisitions which had been shipped at least 25 days prior to date the sample was taken and which had not been recorded as received by the DSU. The mean time from shipment status to the date the sample was taken for those requisitions which had been shipped at least 25 days prior to the sample date was computed to be 135.38 days, with a standard deviation of 42.07 days.

(2) The standard test for the significance of the difference between two means, assuming normality, was made at the 99-percent level of significance. See appendix C for details of the test. The computed  $z$  value of 4.339 rejected the hypothesis that the distribution of time for all receipts with shipment status and the distribution of time for requisitions with shipment status over 25 days old came from the same population. This indicates one of two things; either DSU's are not properly handling receipt documentation and therefore have false dues-in on their records, or shipments are lost. The study team had no information which indicated that lost shipments were a significant problem.

c. An Additional Indicator of Receipt Problems. As was mentioned earlier, no particular significance was attached to the fact that 34 percent of the parts shipped at least 25 days or longer before the date of the sample had not been cleared from the records of the DSU. The reasons were the large standard deviation of shipment times and lack of knowledge of the actual distribution of shipment times.

However, the item quoted below adds validity to the findings and indicates that "ghost" dues-in are a real problem.

"Units report requisitions that have already been shipped. As high as 30% of requisitions reported by some units were already shipped by AMC depots to customers in time to be received prior to cutoff date of the report (Materiel Assistance Designated Report). This suggests that unit receipts are not always being picked up and posted in a timely manner."<sup>22</sup>

d. Corrective Action. The situation explained above should be corrected. Units are waiting for parts which they have already received. Receipt procedures should be reviewed at each DSU to insure compliance with current guidance. The applicable guidance was reviewed (TC 38-2, TC 38-2-1, TC 38-2-2, and TC 38-2-3 for DLOGS, and FM 38-15 for CS<sub>3</sub>) and found to be adequate.

#### 7. TRAINING OF CLASS IX SUPPLY PERSONNEL.

a. Introduction. A factor which would impact, not only on zero balances, but also on any other measure of supply performance is the state of training and proficiency of supply personnel. A check on the training of divisional DSU, maintenance battalion technical supply office, and Materiel Management Agency (MMA) personnel in selected MOS's was made during the data collection phase of the study. Investigation of training for division Prescribed Load List (PLL) clerks was conducted using questionnaires.

b. Status of Training at DSU, Technical Supply Office, and Division MMA Level. Twelve enlisted military occupational specialties (MOS's) were checked at the sample division maintenance DSU's maintenance battalion technical supply offices, and division MMA's. The total sample consisted of 416 personnel. MOS's checked in this manner were 76P20 and 40, 76Q20 and 40, 76S20, 76T20 and 40, 76U20 and 40, 76V20, 76Y20, and 76Z50. The percentage of school trained personnel varied from 50 percent to 100 percent by MOS, and the average (mean) was 87 percent. A breakout by division of the percentage of school trained personnel by MOS is shown in figure 30. The percentage of personnel school trained was high and indicated that lack of formal training was not a major problem. Therefore, this subject was not pursued.

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22. Message, AMCSU-KU, HQ USAMC, 24 May 74, subject: Logistics Readiness, paragraph 2 b, page 2.

MOS	DIV A	DIV B	DIV C	DIV D
76P20	91	69	60	100
76P40	100	62	na	100
76Q20	100	100	66	100
76Q40	na	100	100	100
76S20	82	100	87	100
76T20	68	na	66	82
76T40	85	50	100	50
76U20	100	na	87	100
76U40	100	100	100	100
76V20	66	100	100	100
76Y20	76	na	na	na
76Z50	50	57	100	100

Figure 30. Percent of division DSU, tech supply office, and MMA personnel school trained in selected MOSs.

DIVISION	NUMBER OF PERSONNEL ASSIGNED	LENGTH OF TOUR APPROX. MEDIAN MONTHS
A	134	14.2
B	88	13.5
C	65	20.6
D	129	10.2
TOTALS	416	13.8

Figure 31. Approximate median tour length, DSU, tech supply office, and MMA supply personnel for selected MOSs.

c. Length of Tour for Supply Personnel. The length of time an individual had been on the job has a bearing as to his efficiency. A determination was made as to the amount of time divisional personnel in the maintenance DSU's, technical supply offices, and MMA's had been assigned to their respective duties. The same personnel and MOS's were used for this analysis as were used for the analysis of the percentage who were school trained. The results are shown in figure 31. The data on the average length of tours in figure 31 should be viewed as an approximation of the median length of tour since the data were collected at a point in time and are computed on the basis of the number of months currently assigned personnel had been assigned. It was not possible to determine if the above statistics indicated that the length of tour was above or below average for these divisions, since Army-wide data on actual tour lengths for these specific MOS's were not available. However, the Department of the Army does maintain theoretical tour lengths for CONUS by MOS and these vary from 15 months for MOS 76P20 to 40 months for 76T20.<sup>23</sup> Based upon these standards, the length of tour for personnel in the sample divisions was comparable to the Army as a whole.

#### 8. TRAINING OF DIVISION PLL CLERKS.

##### a. The Questionnaire Results.

(1) Because of the large number of personnel involved, it was decided that a questionnaire would be used to obtain information on division PLL clerks. Questionnaires were distributed to the G4's of the sample divisions requesting that the questionnaires be completed by assigned PLL clerks on a no time limit, open book basis. (See pages D-2 and D-8 of appendix D.)

(2) The questionnaire contained 14 questions designed to test the respondent's general knowledge of procedures he should know to accomplish his daily tasks. There were a total of 24 items in the questionnaire. Those items receiving a relatively large number of incorrect answers are candidates for emphasis in future training and indicate the need for supervisory emphasis on the job.

(3) Question number 13 received the largest number of correct responses and question number 7 received the highest number of incorrect responses. Questions number 4-8 are good

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23. Telephone conversation with MAJ Blanchard, HQ, Dept. of the Army.



examples of a topic (periodic review of the PLL) that is taught in the classroom but in actual practice the function may be performed by a computer. This needs to be considered if a program is initiated to increase the knowledge of this little understood procedure. A summary of correct responses for each question is shown on page D-12, appendix D and a comparison of incorrect responses by division is shown on page D-13, appendix D.

(4) There were five perfect papers in the sample, with one in each of three divisions and two in one of the divisions. These perfect papers reveal an interesting aspect to the determination as to whether this sample is representative of all PLL clerks in the Army. All responded that they had received training at the Quartermaster School and four of them replied that their training had been adequate. The other indicated that his training at the QM School was inadequate but did not elaborate on the deficiencies. One did not respond to the question about time on the job. The others ranged from 6 to 25 months on the job as PLL clerk. Four of the five are in repair parts specialist MOS but only two of them reported that MOS as their primary MOS. The other primary occupational specialties are in maintenance.

(5) The perfect papers were as follows:

- (a) Division A - PMOS 43E2P Parachute Rigger  
DMOS 63C40 Track Vehicle  
Mechanic  
School trained at QMS  
25 months on the job
- (b) Division B - PMOS 76S20 Vehicle Materiel  
Supply Specialist  
DMOS 76S20 Vehicle Materiel  
Supply Specialist  
School trained at QMS  
Did not give time on job
- (c) Division C - PMOS 68F40 Aircraft Electrician  
DMOS 63C40 Track Vehicle  
Mechanic  
School trained at QMS  
9 months on the job
- (d) Division D - PMOS 63B20 Wheel Vehicle  
Mechanic  
DMOS 76S20 Vehicle Materiel  
Supply Specialist

School trained at QMS  
6 months on the job

PMOS 76P20 Stock Control &  
Accounting Specialist  
DMOS 76T20 Aircraft Materiel  
Supply Specialist  
School trained at QMS, not  
adequate  
10 months on job

(6) The 41 responses from Division A represented 19 different primary MOS's with 19 (46 percent) being supply specialists and 5 (12 percent) being maintenance specialists. All of these persons are working in supply-related positions with 38 (92.6 percent) being vehicle repair parts specialists. Eighteen (44 percent) of those taking the test in Division A are working in their PMOS as a PLL clerk. Respondents in Division A averaged 15.4 months on the job.

(7) The 24 responses from Division B represented 17 different primary MOS's, with 10 (42 percent) being supply specialists and 5 (20 percent) being maintenance specialists. All of these persons are working in supply-related positions with 67 percent in the vehicle repair parts specialty. Eleven (45.8 percent) of those taking the test in Division B are working in their primary MOS as a PLL clerk. Respondents averaged 5.9 months on the job.

(8) The 17 responses from Division C represented 11 different PMOS's with 41 percent being either supply or maintenance specialists. There were considerably fewer with supply-related PMOS's than in the other four divisions. All of the respondents, however, are working in supply positions, with 14 (82 percent) being in repair parts positions. Only four of the 17 (23.5 percent) are working in their PMOS as a repair parts specialist. In Division C the respondents to this test averaged 7.3 months on the job.

(9) The 46 responses from Division D represented 23 different PMOS's with 21 (45.6 percent) being supply specialists and 14 (30.5 percent) being maintenance specialists. All of these are working in either supply or maintenance positions, with 43 in the repair parts specialists and 6 in maintenance. Twenty-two (47.89 percent) of those taking the test in Division D are working in their PMOS as PLL clerk. Respondents in Division D reported an average of 9.3 months on the job.

b. Statistical Analysis of PLL Questionnaires.

(1) Two approaches were used in evaluating the results of the PLL clerk questionnaires. First, a subjective analysis based upon weighing specific questions as to importance; and secondly, an analysis assuming all questions and separate items within a question were of equal importance. The results of the subjective analysis are shown in figure 32.

Category	Div A		Div B		Div C		Div D	
	No	Percent	No	Percent	No	Percent	No	Percent
Satisfactory	24	58.5	10	41.7	7	41.1	21	47.5
Borderline	8	19.6	4	16.7	5	29.5	13	27.5
Unsatisfactory	9	21.9	10	41.6	5	29.4	12	25.0
Totals	41	100	24	100	17	100	46	100

Figure 32. Analysis of PLL clerk survey, weighing selected questions.

The rationale for the analysis above was based on the assumption that questions 2, 6, 9, 12, and 15 were less important than the others on the questionnaire.

(2) The second approach was to consider each separate item as an individual question and weigh all questions equally. On this basis there were 24 test items. In response to the 24 questions regarding their duties, the average number of correct responses was 15.8 with a standard deviation of 5.27. The scores ranged from five perfect scores to two responses with only two correct responses. The median score was 16 correct responses. This equates to an overall average of 65.8 percent. There is no established standard of proficiency for this particular MOS. An arbitrary average score of 70 percent correct was set for this analysis to determine if this sample is representative of all repair parts clerks in the Army divisions based in the United States. Page D-14 of appendix D shows a test of the sample mean at a confidence level of 95 percent and it clearly shows that the sample can be accepted as being representative of the population. Also shown on page D-14 is an analysis for the sample from each division, which confirms that the individual divisional responses can also be accepted as being representative of the population with an assumed mean score of 70 percent.

(3) The overall average of 65.8 percent correct for this questionnaire cannot be readily compared to recent MOS test results because test formats are not the same. This questionnaire was limited to supply procedures at the organizational level. The standard MOS test for the Vehicle Repair Parts Specialist (76S), for example, is divided into six major duty areas. The November 1973 test results for 981 persons in MOS 76S20 revealed that 31 percent scored in the average range (75-46 percent) for that portion of the test which pertained to organizational supply procedures. Only 1 percent scored above the average range and 68 percent scored below the average range. The results were about the same for 269 persons in MOS 76S40, with 33 percent in the average range. The average figure was higher, 14 percent, leaving 53 percent below average in their knowledge of organizational supply procedures. The Army-wide tests indicate a greater need for training than do the results of the questionnaire.

(4) A comparison of the percent of correct responses in each division with the percent of school-trained parts clerks and the average months on the jobs suggest that definite relationships exist (see appendix D, page D-15). Division A had the highest number of correct responses, the lowest number of school-trained clerks, and the highest average of months on the job. Percentage figures were used instead of actual numbers because of the relatively low number of responses from Division C.

(5) There is an indication that a direct relationship exists between the correct responses, school training, and time on the job. A statistical analysis confirms that these relationships do exist; see appendix D, page D-16.

(6) In addition to the questions testing the respondent's knowledge of the job, the survey asked several questions about the individual's primary and duty MOS, whether he had received a formal course of instruction on the duties of the repair parts specialists and the duration of time he had spent on the job. The questionnaire ended with a request for comments on how the training of PLL clerks could be improved. The comments are summarized here for each division. The general theme throughout the replies was a request for more training, both in the classroom and on the job, and the need for a single procedure for supply operations at the unit level. The comments are given verbatim so as to not destroy the frankness of the replies and to demonstrate the earnest request for more training and a chance to do a better job. All did not ask to go away to school and many asked for a school to come to them.

(a) Division A

1 I am qualified in unit PLL but know nothing of direct support, general support and depot level.

2 Try to make one system for all to use.

3 Give some practical experience along with training.

4 Combine all the references; AR's, Training Circulars, etc.

5 PLL clerks should have an interim period of on the job training with an instructor overseeing the operation.

6 No additional duties.

7 More training on the automated procedures such as DLOGS.

8 Do not expect as much from OJT people as from school trained people.

9 Make it more clearer as to what PLL is all about.

(b) Division B

1 Have more OJT during classroom training.

2 We should go with an inspection team to see what kinda mistakes we are making.

3 PLL clerks should be better trained.

4 Only people who have a year remaining should be allowed to work in PLL section.

5 Clerks should be at duty job every day. At present most clerks are being misused.

6 If we could set one policy and follow it but lately changes occur so fast you can't keep up with it.

(c) Division C

1 Send PLL clerks to school and then keep them off other duties by letting them work in their jobs.

2 If there was one regulation covering all procedures instead of one for every division and battalion.

3 It would help the supply system if Armorers, CBR and Communications personnel had some knowledge on repair parts procedures.

4 PLL schools give only basics but you go different places and learn different rules.

(d) Division D

1 PLL clerks learn their job after they are assigned to a unit, not at the Quartermaster School.

2 Open a PLL training school here.

3 Send me to school.

4 Send me more information on the job applicable to this post.

5 Teach the DLOGS system.

6 Use only trained people in PLL.

7 Have more training on the whys of problem areas.

c. Summary discussion.

(1) The same conclusion is reached whether the PLL clerk questionnaires are analyzed subjectively or objectively, and that is, that PLL clerks require additional training.

(2) The most significant recommendation was made by those who requested more training. It must be in the classroom, at the duty station, and on the job. There must be quality instruction in the classroom and superior supervision on the job to prepare a parts clerk for his job and to maintain a level of proficiency which will provide not only acceptable results, but also personal satisfaction in being a member of a good organization.

(3) It is worthy of repeating that not every one asked to go to a school and that several asked that a school come to them. The Training Extension Course (TEC) concept of providing a training package at the unit level is an approach to this request. The TEC program uses multi-media equipment and programed texts and is designed for individual

instruction. The program is still in development, but some courses have been fielded with considerable success. The TEC PLL course should be fielded between February and May of 1975. As presently planned TEC training can be optional with the individual; for example, the individual may want to prepare himself for a MOS test; or it can be made mandatory if the commander feels that additional training is required. It is recommended that the TEC program for repair parts clerks be made mandatory training initially at the division level and that subsequent refresher courses be optional or mandatory as the commander prescribes. In addition, instruction should be provided on local procedures.

(4) Along with training prior to and during an assignment goes the assumption that the individual is being used in his primary MOS or a secondary MOS in which he is qualified. Maintenance specialists seem to do quite well in parts clerks positions after the prerequisite training. Using an individual in a skill in which he feels comfortable is also a part of job satisfaction and increased productivity.

(5) After the right person is put in the right job and given the necessary training, he should be permitted to remain in that position for an extended period of time. The percentage of high test scores in Division A and the relatively high number of months on the job should confirm this comment. The opposite percentages in Division B test scores indicate results of not having stabilized personnel.

(6) One other request from a large number of the respondents to the survey is the one requesting a single procedure for repair parts supply. The four divisions sampled represented three versions of supply accountability at the user level. Division A uses the DLOGS system. Division D also has DLOGS but uses different computer support equipment. Divisions B and C use the CS3 system. The Quartermaster School began teaching the DLOGS system to repair parts specialists in May, 1974. (The survey was made in April 74.) It is apparently not feasible, at this time, to have a single procedure throughout the Army, and therefore it is necessary for major commands in the United States and overseas to conduct local schools for new clerks.

## 9. ESSENTIALITY OF REPAIR PARTS.

a. Prior to the initiation of this study, the LOGC and Ordnance School were involved in a project called "Maintenance Support Planning - Transition to Wartime." The key element of this project was to determine the combat essentiality of

repair parts for the 2 1/2-ton truck (M35A1). Primarily, the Delphi Technique was used by the Ordnance School to determine repair part essentiality.

b. The QMS study team received a list of the parts (which included components) tentatively selected as being mission essential for the 2 1/2-ton truck; and during the division data collection phase of the study determined the stock status of these parts in each of the divisions. Figure 33 is a summary of the results:

Category	DIV A	DIV B	DIV C	DIV D
Vehicle Density	218	616	615	198
Percentage of Parts on ASL	63%	69%	44%	58%

Figure 33. Percentage of 104 repair parts for the 2 1/2-ton truck which are on division ASL's

One would expect that the vehicle density and the percentage of these parts which are stocked would be directly related. This relationship may exist in a larger sample but is not indicated by these data. Division D has the lowest vehicle density but not the lowest percentage of parts stocked. Division B had the highest vehicle density and the highest percentage of parts stocked. However, Division C had only one vehicle less than Division B but had the lowest percentage of parts stocked.

c. A more revealing analysis is shown in figure 34.

17 Parts (16%) Not Stocked in Any Division
9 Parts (9%) Stocked in One Division
29 Parts (28%) Stocked in Two Divisions
23 Parts (22%) Stocked in Three Divisions
26 Parts (25%) Stocked in all Four Divisions

Figure 34. Number and percentage of 104 parts for the 2 1/2-ton truck stocked in four CONUS divisions.



The above analysis reveals that only 17 parts, out of the total of 104, were not stocked in any of the divisions. On a cumulative basis, 25 percent were stocked in all four divisions, 47 percent in three or more of the divisions, 75 percent in two or more, and 84 percent in one or more of the divisions. Although the stock status of these parts was not checked at the NICP's, it is quite possible that as many as 84 percent of these parts receive sufficient demands to be stocked at the wholesale level. The parts that would require a critical examination are the 17 that were not stocked in any of the divisions. If these are truly combat essential, they could be stocked as insurance items at the wholesale level.

d. The question of essentiality of repair parts is one that impacts on both supply and maintenance, particularly during periods of budget restrictions. This subject will be discussed in more detail in section II of this chapter. However, this example of essentiality of parts for the 2 1/2-ton truck indicates the magnitude of the problem and a method of implementing decisions based upon essentiality. The data indicate that a high percentage of essential parts is stocked on the basis of demands. This eliminates most of the problem from a funding standpoint. The remaining essential items could then be added as insurance stockage. This, of course, would require additional funds. The key, then, is to identify those essential parts which are not already stocked and take action to stock them.

e. Quartermaster School analysis of the 104. 2 1/2-ton truck parts was discontinued prior to completion for two reasons. First, the list of parts was only tentative and did not represent the official position of the Ordnance School, and secondly, the 2 1/2-ton truck was dropped from the "Maintenance Support Planning - Transition to Wartime" project and replaced by the 5-ton truck.

#### 10. OPERATIONAL READINESS AND SUPPLY PERFORMANCE.

a. One of the principle objectives of this study was to determine the relationship between zero balances and materiel readiness. Intuitively this relationship exists. It is also known that zero balances can be influenced by varying stockage criteria. Therefore, the approach planned was to determine the extent of the problem and then simulate changes in stockage and retention criteria to determine the probable effects on materiel readiness. As a starting point worldwide Operational Readiness Rates (ORR), Not Operationally Ready, Supply (NORS), and Not Operationally Ready, Maintenance (NORM) data were gathered for the sample end items. The data obtained were as of the third quarter fiscal year 1974, and are shown in figure 35.

WEAPONS SYSTEM	ORR	NORS	NORM
HEL, UH-1	74.3	8.0	17.7
HEL, AH-1G	70.6	11.0	18.4
HEL, OH-58	74.6	10.0	15.4
HEL, CH-47	61.3	14.6	24.1
HOW, M109	76.7	16.8	6.5
ARAAV, M551	71.3	17.6	11.1
APC, M113	86.7	9.8	3.5
TANK, M60A1	81.9	11.3	6.8
TRK, 1 1/4-ton, M561	89.9	7.8	2.3
TRK, 2 1/2-ton	90.5	6.2	3.3
GUN, M163	71.4	25.6	3.0
GUN, M107, M110	78.9	12.9	8.2

Figure 35, ORR, NORS, and NORM rates for selected items.

SOURCE: Maintenance Management Center (ground equipment) and US Army Aviation Systems Command (helicopters).

It is interesting to note that, without exception, the NORM rates were higher than the NORS rates for aircraft, and the NORS rates were higher than the NORM rates for ground equipment.

b. The relationship between the order and shipping times for ASL parts for the sample end items and ORR, NORS, and NORM rates was compared and no meaningful correlation was found. This indicates that other supply performance indicators, such as fill rates and demand accommodation and satisfaction may have a more meaningful relationship to materiel readiness.

c. At this point, the study team learned of several actions which largely duplicated our approach to the subject of supply performance and materiel readiness. The LOGC

initiated a separate study titled "Operational Readiness Rate Correlation to Logistics Performance Indicators," and General Research Corporation (GRC) was nearing completion of a study titled "Supply Policies and Equipment Readiness; A Study of Selected Units and Weapons Systems." This duplication of effort was discussed at the 22 August 74 repair parts IPR and it was determined that the QMS should discontinue its study effort on this subject.

d. A draft copy of the GRC report mentioned previously was received and confirmed the belief that relationship exists between supply performance and materiel readiness. GRC's study was concerned with three end items: the M60 tank, the 5-ton Cargo Truck, and the UH-1 helicopter. Data from the 4th and 8th Infantry Divisions, TACOM, and AVSCOM were used. Since the items used in the GRC study were also items used in the QMS study, the findings of the GRC study are of interest. Portions of the summary and findings of this study are reproduced below:

#### Weapon System-oriented Stockage Policy

It is possible to enhance supply performance, and thus operational readiness, through the technique of applying varying demand-based stockage criteria according to groupings of similar end item applications. This improvement may take the form of better demand accommodation and fill rates, or reduced parts shortages and duration thereof, or lower NORS rates, reduced stockage list turbulence, reduced stockage list size, or several combinations of these performance factors.

Considerable difficulty arises in the implementation of such policies, however. Inability to ascertain the end item application, applications that differ from the principal one listed in AMDF, and multi-application "common hardware" items are but a few of the more significant problems posed. Overcoming them may be facilitated with the eventual introduction of more sophisticated computer systems at the DSU level, but the improvement may be marginal. The data abound with indications that personnel-generated difficulties far outweigh those directly relatable to computer hardware or software.

Modifications of the general scheme of policy by equipment type are possible, and one or more of them may be viable alternatives. Policy by materiel

category is the most prominently espoused version, but it too may have certain of the undesirable characteristics of the subject approach. The approach that seems most appropriate at this juncture is the pragmatic one: grouping of repair parts demanded into rather broad categories, such as aircraft, missiles, combat equipments, tactical equipments, communications gear, and all others, applying varying criteria to these, and perhaps augmenting this with relaxed stockage criteria for readiness-affecting parts, as described herein and summarized below.

It is clear that any policy appropriate at one division is not necessarily the best course of action at all others. Marked differences are evident in demands, readiness, policies, and procedures between the two divisions visited.

#### Selective Stockage of Readiness-affecting Parts

As an adjunct to the policy finally chosen, careful consideration should be given to selective stockage of the few items that are known to have caused NORS in the past. The simplest method of accomplishing this would appear to be addition, to the demand-supported stockage list, of those secondary repair parts that have appeared on the materiel readiness reports of the unit during the past year (or perhaps longer). An alternative that should be investigated is stockage of deadliners at respective COSCOMs. The depth of stockage for such parts need not be established in accordance with the normal rules (as was done in the analyses herein), but only needs to be sufficient to satisfy NORS requirements as they occur. One possible approach to this might be to stock two of each such part that does not qualify based on demands. Other depth policies could be investigated as experience decrees. Whatever the method used, it is clear that some "insurance" stockage can be provided for known-deadliners, and at a cost that can readily be absorbed, perhaps via application of more stringent criteria for the less-essential categories of materiel. In the event of fund curtailment, parts with deadlining histories should be requisitioned first.

## Non-recording of Demands for Deadliners

There is strong evidence that not all demands are recorded on the computers at the divisions, that post-posting actions required to record high priority demands are not taking place, and that some unfilled demands may never be registered on the formal supply system at all. The implications of this situation are grave, and immediate corrective action is indicated.<sup>24</sup>

### 11. FINDINGS.

a. Whether the entire repair parts sample data are used or only the data for the 14 items selected as an end item sample, the conclusion concerning order and shipping times is the same. OST's for high priority requisitions are excessive when compared to the AR 725-50 standard of 7 days.

b. Excessive OST's are symptomatic of more serious problems. The two major problems identified are zero balances and document processing problems. ASL zero balances in the sample divisions averaged 24 percent and zero balances with dues-out, 5 percent. At the installation level ASL zero balances averaged 19.5 percent. Stockouts are a function of the variables of inventory policy, to include addition and retention criteria. Addition and retention policy changes were not addressed since the subject has been examined in other studies. A component of inventory policy which was addressed was order and shipping times. Actual OST's which exceed those used in inventory policy will create zero balances. AR 710-2 provides for the computation of variable OST's by materiel categories. It was found that CS3 units were using variable OST's, but DLOGS units were not computing variable OST's. The QMS has requested that the necessary changes be made to DLOGS to provide this capability.

c. A number of examples of document processing problems were identified. The most serious problems were excessive processing times from the unit to the appropriate NICP and those cases where units have parts due-in, the requisitions for which have never been received at the NICP. Command review of processing procedures at the local level should resolve some of the problems. In addition, planned changes

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24. Karadbil and Foohey, Supply Policies and Equipment Readiness; A Study of Selected Units and Weapons Systems, General Research Corporation, August 1974, pages 80 and 81.

to the SAILS program should improve the reconciliation situation. If not, additional study may be required to pinpoint specific processing and reconciliation problems and provide solutions.

d. AR 710-2 states that the ASL objective for a maintenance battalion is 5,000 lines (with a management range of 4,000 to 6,000 lines) and that a more stringent stockage policy may be used to reduce the ASL if it is excessive. Supply performance data for the sample divisions indicated that demand accommodation and satisfaction performance were below regulatory standards, in spite of the fact that ASL sizes were greater than the 5,000 line objective. Compliance with the 5,000 line objective. Compliance with the 5,000 line objective may result in decreased supply performance and the validity of the standard is questionable.

e. A lack of inventory accuracy can result in the creation of zero balances or excesses. A sample inventory at the divisions revealed inventory accuracy of 43.9 percent, with overages and underages approximately equal. The inventory problem has been documented in other studies and appears to be a continuing problem. Written guidance on the subject is fragmented among a number of publications which makes it difficult for an individual to fully understand all of the details which must be considered to properly conduct and reconcile a physical inventory. The QMS is in the process of preparing a training circular which will fully explain physical inventory procedures.

f. An unexpected finding of the study was a problem with cancellations. Eleven percent of the repair parts sample were cancellations. In two of the four sample divisions 26 percent of the NORS requisitions were later canceled. It was also found that 25.9 percent of division ASL requisitions and 32.5 percent of NSL requisitions for parts which were canceled were actually shipped. It is understandably difficult to frustrate shipments; however, the chances of doing this can be increased if the need for a cancellation is made known faster than it is at the present time. It was found that the average time from the requisition document date to the request for cancellation date averaged 50.6 days for ASL items and 52.1 days for NSL items. In an effort to reduce this time, a proposed change to AR 725-50 will be recommended which will require a periodic review of requirements.

g. The study revealed that in a number of cases units are waiting for parts which they have already received. Two different data sources support this conclusion and indicate problems in receipt procedures. Current published guidance appears adequate. Receipt procedures at the DSU level should

be reviewed for compliance with TC 28-2-3 for DLOGS and FM 38-15 for CS3.

h. The training of individuals was felt to be a factor, not only in regard to zero balances, but in all areas of supply performance. It was found that 87 percent of the enlisted personnel checked at the DSU, division MMA, and maintenance battalion technical supply office level had received formal training in their MOS's. Because of the high level of training this area was not pursued further. The proficiency of the unit PLL clerk was also of interest because of this individual's key position in the repair parts supply system. Due to the number of individuals involved, a questionnaire was developed to test the knowledge of PLL clerks. The results were disappointing; the average correct response was 65.8 percent. The questionnaire revealed the need for additional training, specifically on-the-job-training. The TEC program appears promising and should improve the knowledge of divisional PLL clerks if the training is made mandatory and supplemented with instruction on local procedures.

## Section II. Wholesale Level

### 1. AMC NICP SUPPLY PERFORMANCE.

a. Visits to AMC NICP's were conducted during the period May through August 1974. All NICP's were visited with the exception of the US Army Missile Command (MICOM). The principal purpose of the visits was to research data related to the repair parts sample; however, NICP-wide supply performance information was also obtained in order to get a general idea of the performance of the wholesale supply system.

b. Supply performance varied considerably among the commodity commands. ASL zero balances ranged from a low of 1.4 percent for the US Army Armament Command (ARMCOM) to a high of 13.6 percent for the US Army Electronics Command (ECOM). Demand accommodation was reported for two commands and in both cases the percentage was 92.4. This appears to be quite good; however, additional comments will be made on this statistic later. Demand satisfaction and/or stock availability (the terms are synonymous) ranged from 60.8 percent for ECOM to 78 percent for the US Army Tank Automotive Command (TACOM). These comparisons are based upon the latest months statistics from figures 37 through 41.

c. Demand accommodation rates for those commands which reported this statistic appear quite high; however, under current policy are not excessive. AMC has been refining an inventory policy which was originally called the Operational

Readiness Oriented Supply System (OROSS). OROSS and refinements to the basic concept are now formalized in a revision to chapter 4 of AR 710-1, Requirements Determinations and Computations for Secondary Items.

MONTH	NO OF LINES ASL	NO OF LINES NSL	PERCENT ZERO BALANCE W/DUES-OUT	PERCENT DEMAND ACCOMMODATION	PERCENT DEMAND SATISFACTION
APR 74	50,805	3,730	1.4	92.4	74.2
MAR 74	32,780	4,421	2.8	88.8	71.6
FEB 74	31,308	3,977	2.8	89.4	72.8
JAN 74	25,243	3,613	2.3	87.7	75.6
DEC 73	33,685	5,469	1.8	86.3	74.1
NOV 73	32,135	4,564	1.8	88.0	73.0

Figure 36. US Army Armament Command (ARMCOM) supply performance.

SOURCE: ARMCOM

MONTH	NO OF LINES ASL	NO OF LINES ASL	PERCENT ZERO BALANCE W/DUES-OUT	STOCK AVAILABILITY
JUN 74	40,749	156,016	5.9	67
MAY 74	40,749	156,261	6.1	69
APR 74	40,462	157,787	6.1	64
MAR 74	41,369	157,550	6.1	63
FEB 74	42,795	158,617	6.1	63
JAN 74	42,264	159,996	6.1	63

Figure 37. US Army Aviation Systems Command (AVSCOM) Supply performance.

SOURCE: AVSCOM



MONTH	NO OF LINES ASL	NO OF LINES NSL	PERCENT ZERO BALANCE W/DUES-OUT	STOCK AVAILABILITY
SEP 74	44,806	32,550	13.6	60.8
AUG 74	44,833	32,571	13.3	63.4
JUL 74	44,774	32,655	13.8	63.1
JUN 74	44,197	32,422	11.0	63.1
MAY 74	44,317	32,199	11.4	64.9
APR 74	44,699	32,665	11.4	61.9

Figure 38. US Army Electronics Command (ECOM)  
supply performance.

SOURCE: ECOM

MONTH	NO OF LINES ASL	NO OF LINES NSL	PERCENT ZERO BALANCE W/DUES-OUT	STOCK AVAILABILITY
AUG 74	5,821	10,802	5.8	69.1
JUL 74	5,141	13,345	5.9	68.4
JUN 74	5,485	14,150	5.6	64.5
MAY 74	5,414	14,100	5.7	67.0
APR 74	5,327	14,216	5.8	60.7
MAR 74	5,197	14,328	6.6	65.7

Figure 39. US Army Troop Support Command (TROSCOM)  
supply performance.

SOURCE: TROSCOM

MONTH	NO OF LINES ASL	NO OF LINES NSL	PERCENT ZERO BALANCE W/DUES-OUT	PERCENT DEMAND ACCOMMODATION	PERCENT DEMAND SATISFACTION
APR 74	26,282	26,579	10.7	92.4	78
MAR 74	25,999	26,411	10.6	92.2	78
FEB 74	26,035	28,347	11.3	92.1	76
JAN 74	26,166	28,176	11.6	90.4	73
DEC 73	23,876	30,401	12.1	91.3	73
NOV 73	23,635	32,589	13.3	89.2	74

Figure 40. US Army Tank Automotive Command (TACOM) supply performance.

SOURCE: TACOM

The basic concept is that stockage decisions are based upon economic and materiel readiness considerations. Stockage policy is modified as required to provide estimated demand accommodation rates equal to the desired worldwide operational readiness for appropriate weapons systems or end items.<sup>25</sup> Weapons systems and/or end items not assigned NORS rates or those with assigned operational readiness standards below 85 percent are supported to provide 85 percent demand accommodation.<sup>26</sup>

d. An example of demand accommodation rates that are required is shown in figure 41 for TACOM. Some systems require demand accommodation rates as high as 96 percent. It is also interesting to note the different add-and-delete criteria. These are adjusted to provide the desired demand accommodation, and vary considerably from one weapons system to another.

e. Current AMC inventory policy is definitely a significant improvement as compared to fixed add-and-delete criteria. However, a comment that can be made is that the system is centered on the demand accommodation rate. Demand accommodation

25. Letter, AMCSU-KP, HQ USAMC, 29 Jun 74, subject: Final Draft Revision - Chapter 4, AR 710-1 (Requirements Determinations and Computations for Secondary Items), paragraph 4-27c(1), page 39.

26. Ibid., paragraph 4-27c(2) & (3). page 39.

SYSTEM	NORS RATE	PERCENT DEMAND ACCOM	FREQUENCY OF DMD (2 YEARS)	
			DELETE	ADD
SP GUNS, HOWITZER & RECOVERY VEHICLE SYSTEM	8	92	8	10
ARMORED PERSONNEL CARRIER & MISSILE SYSTEM	7	93	12	15
TANK & RECOVERY VEHICLE SYSTEM	9	91	8	10
5 TON THRU 50 TON SYSTEM	7	93	18	22
1/4 TON THRU 1-1/4 TON SYSTEM	4	96	32	30
2-1/2 TON TRUCK/ TRAILER	5	95	12	15
TIRE, BATTERIES, KITS & ACCESS	4	96	24	30
MULTI-APPLICATION PARTS	4	96	11	14

Figure 41. TACOM OROSS stockage criteria,  
Army stock fund only.

SOURCE: Materiel Management Directive 700-32, USATACOM,  
20 Jul 73, subject: Logistics, Stockage Candidate System,  
Appendix C.

represents the percentage of total valid demands received for items that are listed on the authorized stockage list, i.e., demands that can be accommodated by the ASL. Demand accommodation is a useful statistic but does not relate directly to customer satisfaction. Demand satisfaction and/or stock availability are more meaningful from the customer's standpoint; for these statistics identify, for those requisitions which match the ASL, the percentage that are filled from stock on hand. Figures 36 through 40 show that demand satisfaction and stock availability rates for AMC NICP's are all below 85 percent. The question boils down to which standard should be used as a goal, demand accommodation or demand satisfaction/stock availability. It can be seen intuitively that significant

improvement, from a customer standpoint, would be achieved if wholesale stockage policy was adjusted to provide demand satisfaction equal to the operational readiness rate assigned to a particular weapons system/end item. This change would require additional inventory investment and a cost analysis would have to be conducted to determine the practicality of such a change.

f. It was previously mentioned that ASL zero balances with dues-out varied from 1.4 percent to 13.6 percent for the five AMC NICP's visited. The percentage figures, however, only tell part of the story. Of greater importance is the length of time the parts remain at zero balance. Figure 42 illustrates the seriousness of the problem. Line 3 shows the percentage reduction in the number of lines, Federal Stock Number's (FSN's), at zero balance over a 13-month period. It can be seen that this ranged from 9 percent to 57 percent, with an AMC average of 17 percent. This means, based on the AMC average, that 83 percent of the lines that were at zero balance on 30 June 1973 are still at zero balance as of 31 July 1974. The problem, then, is not so much the percentage of zero balances, but the fact that when a FSN goes to zero balance it remains in that condition for an extended period of time. It is interesting to note that when a FSN is returned to an in-stock position it does not return to a zero balance condition in the short run (figure 42, line 9). The challenge, obviously, is to prevent zero balances rather than react to them after they occur.

## 2. NICP PROCESSING OF SAMPLE REPAIR PARTS.

### a. Completed Requisitions.

(1) The repair parts which related to the 14 end item sample used in this study were supplies by three of the six AMC commodity commands: TACOM, ARMCOM, and AVSCOM. Status and status dates were obtained for the requisitions for which each command was listed in the AMDF as the source of supply. Figure 43 is a summary of the information for the completed requisitions in the sample. The OST's shown do not include the time from the date the unit prepared the request until receipt of the request at the DSU or the time from DSU receipt of the part to receipt of the part by the unit. Figure 44 shows weighted average data for parts that were ASL and NSL to the divisions. Appendix E provides a detailed analysis for the completed requisitions by ASL and NSL.

(2) The increment of time from the document date to receipt of the requisition at the NICP was obtained for the AVSCOM requisitions and was found to average 3.9 days. If the AVSCOM data are representative, this would indicate that DSU and installation processing is fairly efficient; however, information which contradicts this assumption was discussed in section I of this chapter.

ELEMENTS	ECOM	TACOM	ARMCOM	TROSCOM	AVSCOM	MICOM	AMC TOTAL
1. No. of FSNs in zero balance (\$/B) 30 Jun 73	3010	2966	675	306	2410	1256	10,623
2. No. of FSNs in 1 above remaining \$/B	2729	2562	290	265	2042	972	8,860
3. Percent Reduction	9%	14%	57%	13%	15%	23%	17%
4. New \$/Bs Generated	351	711	292	39	352	332	1,454
5. Total No. of \$/B Items	3080	3273	582	304	2394	1304	10,937
6. No. of FSNs on line 5 for which procurement and/or repair request have not been initiated	0	0	0	36	36	159	231
7. No. of FSNs on line 5 for which procurement and/or repair request have been initiated but are not on contract and/or firm repair schedule	1631	1407	214	0	613	206	4,071
8. No. of FSNs on line 5 on contract and/or firm repair achedule	1449	1866	368	268	1745	939	6,635
9. No. of FSNs on line 2 returned to an in-stock position and reverted to \$/B condition again	0	0	0	0	0	0	0

Figure 42. Status of AMC zero balance, secondary items, as of 31 July 1974.

SOURCE: HQ AMC

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(1) Command	(2) Document Date to Shipment Status (Means Days)	(3) Shipment Status to Receipt by DSU (Mean Days)	(4) OST for Regns with Shipment Status (Mean Days)	(5) Percent of Regns with No Record Status	(6) OST for Regns with No Record Status
ARMCOM	27.5	12.6	40.1	45.4	35.3
AVSCOM	21.8	17.9	39.7	31.7	29.3
TACOM	52.9	22.3	75.2	37.0	43

Figure 43. Summary of completed sample requisitions for parts supplied by ARMCOM, AVSCOM, and TACOM.  
2-64

(3) A large percentage of the completed requisitions had a no record status (BF) at the supporting NICP. This indicates that these requisitions were filled by the installation supporting the division (assuming the NICP status data is 100 percent correct). If this is the case then the retail level has a serious processing problem, since OST for requisitions with a BF status at the NICP ranged from 29.3 to 43 days (column 6, figure 43).

(4) The mean times from shipment status to receipt by the DSU seemed fairly reasonable, except for TACOM (column 3, figure 43). A closer examination of the TACOM data showed the presence of some extreme values. There were ten shipment times over 90 days, 4 ASL and 7 NSL. If these were deleted from the sample, mean shipment time for TACOM would be reduced from 22.3 days to 16.5 days. This appears to be a reasonable action since it is not likely that it would take more than 90 days to complete a shipment in CONUS. These extreme values are another indicator of division receipt problems, or possibly, lost shipments.

(5) Whether one looks at OST with shipment status, or no record status, the conclusion is the same: OST's are too long for priority 02 and 03 requisitions. However, the fact is that OST is not, in itself, a problem, but rather a problem indicator. The real problems are processing delays and zero balances.

b. Open Requisitions.

(1) By definition open requisitions can't be analyzed for order and shipping time. However the data do reveal pertinent information. Detailed information by division ASL and NSL for open requisitions is shown in appendix F. Figure 44 is a summary of these data for ARMCOM, AVSCOM, and TACOM. The mean days from document date to shipment status, shown in column 1, are similar to the same statistics for completed sample requisitions. The data in column 2, however, cannot be fully explained by DSU-NICP OST, with the exception of TACOM. For ARMCOM and AVSCOM parts, something is drastically wrong. Column 2 and 4 indicate units are waiting for parts which they will never receive. This is another indicator of a document processing problem in the supply system.

(2) Because of the time lag between the collection of divisional data and NICP status and status dates, the majority of open requisitions had a shipment status (column 3). The next largest percentage category was requisitions with a no record status at the NICP's (column 4). The implications of this were discussed previously. The percentage of parts

Command	(1) Document Date to Shipment Status (Mean Days)	(2) Document Date to Sample Date (Mean Days)	(3) Percent Shipment Status	(4) Percent No Record Status	(5) Percent Backorder Status	(6) Percent Canceled
ARMCOM	31.1	128.8	67.2	18.8	8.4	5.6
AVSCOM	19.2	80.7	54.7	43.0	1.7	.6
TACOM	52.3	76.1	58.1	24.8	10.1	4.3

Figure 44. Summary of open requisitions for parts supplied by ARMCOM, AVSCOM, and TACOM.



(requisitions) on backorder at the NICP's varied from 1.7 percent to 10.1 percent (column 5). Finally, column 6 shows the percentage of cancellations, which includes both NICP cancellations and rejections.

(3) Columns 3 through 6 for TACOM total 97.3 percent rather than 100 percent due to the presence of a few requisitions with BK (requisition reported), BV (being procured for direct shipment), and AF6 (followup to a materiel release order) status, which were not shown in figure 44.

c. Cancellations. Cancellations were discussed in some detail in section I and the statistics were presented in figures 22 through 25. All commodity commands have programs to process cancellations; however, if a part is in stock the odds are in favor of the part being shipped. If the part is out of stock, the cancellation will be honored and procurement action may be modified if a contract has not already been awarded.

### 3. SUPPLY MANAGEMENT.

#### a. General.

(1) The data presented thus far explain basically what is happening but not why. In order to determine why parts get into a bad stockage position, individual parts files maintained by AMC NICP item managers were reviewed in detail. This type of research is extremely time consuming but was the only method that was found effective. A total of 61 stock numbers was reviewed in this manner and represented all AMC commodity commands with the exception of MICOM. Although the sample wasn't large, problems reoccurred with sufficient regularity to convince the study team that significant problem areas had been identified.

(2) Supply management as used in this section has a limited meaning. The study team was primarily interested in determining if the inventory policy being used was realistic and not whether the theory was adequate. As has been stated previously AMC's wholesale policy is considered to be basically sound, in theory. The problem, of course, is that any inventory policy consists of a set of variables, primarily requirements determination time (RDT), administrative leadtime (ALT), production leadtime (PLT), and forecasted demand. Each of these components of inventory policy can vary considerably and result in the creation of zero balances or excesses. The basic problem is to accurately track these components and adjust inventory policy as necessary. Safety levels, although a

component of inventory policy, and a variable, do not present the same type of problem as items previously mentioned. Safety levels are controlled entirely by the item manager or are automatically adjusted by the inventory management program.

(3) The remainder of this section is a discussion of several areas where problems were noted. The number of stock numbers, out of the total of 61, which experienced the problem is indicated in the discussion of each topic. A detailed discussion of each of the 61 stock numbers is presented in appendix G.

b. Safety Levels. In some cases (18 out of 61), problems existed with the safety levels established for the stock numbers checked. Examples of excessive safety levels were found in one NICP which used the ALPHA system. On the other hand, examples were found at another NICP (non-ALPHA) where no safety levels were established until the item was in trouble.

c. Requirements Determination Time (RDT).

(1) At the time of the visits to AMC NICP's, RDT and RDT quantities were not considered in inventory policy at several NICP's (23 out of 61 stock numbers evidenced problems in this area). RDT is a valid component of inventory policy and quantities should be computed and stocked to account for this time. The lack of RDT quantities increases the risk of creating zero balances. One solution is to automate the supply control study process so that Procurement Work Directives (PWD's) are issued automatically when the reorder warning point is reached. This is one of the objectives of ALPHA and apparently has been recently accomplished at TACOM with their Zero Base Requisitioning Objective concept. The problem appears to be most serious at ARMCOM and ECOM. The time required at these commands for RDT varies considerably, but this study indicated the need for 15 to 30 days stockage of RDT quantities.

(2) AMC HQ had been aware of this problem for some time but previous efforts to fund RDT have not been successful. However, it was learned on 1 November 1974 that AMC had received verbal approval from the Department of Defense to use seven days RDT for medium and low dollar value items and 15 days RDT for high and very high dollar value items. AMC did not receive funds with the authority to use RDT and will have to request funds for the RDT quantities required.

(3) AR 710-1, as presently written, contains instructions that state, in summary, that in the interest of economy RDT will not be included in computation of the requirements objectives. It is assumed that, in view of the paragraph above, AMC will change the applicable portions of AR 710-1.

d. Administrative Leadtime (ALT).

(1) A large number of the stock numbers reviewed experienced problems with ALT (30 out of 61). The major problem was that ALT used in inventory policy was often not kept current with actual experience. A number of cases were noted where the ALT used in the supply control study was considerably less than the actual ALT. Several stock numbers revealed actual ALT's 6 to 12 months in excess of that used in the supply control study. Excessive ALT's are generally caused by a lack of bidders on competitive procurements or deferral of procurements due to funding limitations. Whether or not such problems can be foreseen is questionable. However, efforts should be made to adjust ALT to anticipate market conditions to the extent possible. If this is determined to be impractical, then provisions for variations in ALT should be accounted for in the safety level.

(2) The problem of funding limitations is a constraint that disrupts the entire supply management process. No simple solution exists for this problem when it occurs; however, a management approach will be suggested in the discussion on essentiality of repair parts.

e. Production Leadtime (PLT).

(1) Excessive PLT contributed more to zero balances than any other single cause for the stock numbers reviewed (31 out of 61). Actual PLT which exceeded the PLT used in the supply control study was the direct cause of a number of items being at zero balances. The major reason for excessive PLT's was found to be delinquent deliveries by contractors.

(2) The problem of lengthening PLT's is well known, as are the basic reasons: a booming economy, raw material shortages, etc. A considerable volume of material has been written on lengthening leadtimes and it would serve no useful purpose to repeat a discussion of this subject. In spite of the problems involved, commodity or item managers have the responsibility of adjusting their PLT to insure that they have stock to support Army requirements.

(3) AMC has been actively searching for ways to solve the leadtime problem. During discussions with AMC personnel, a number of possible solutions for current PLT problems were explored. Some of the more important proposals that appear to have merit are as follows:

(a) The use of flexible delivery schedules for Invitation for Bid's (IFB's) that would permit some latitude in the selection of a source of supply.

(b) The possibility of expanding the base of subcontractors by requiring the prime contractor to have more than one source for long leadtime items.

(c) Include repair parts requirements in the annual procurement of major end items.

(d) Expand the Arsenal's capability to produce long leadtime repair parts.

(e) The Defense Contract Administration Service (DCAS) and the other military services should be contacted when a no-bid IFB response is experienced to locate possible manufacturers.

(4) DSA recently circulated to procurement, contract, and supply personnel a tabulation of manufacturing lead times compiled from DCAS, trade journals, trade associations, and from the manufacturer to the buying market statistics. This information was intended to be used by DCAS during preaward surveys and review of proposed delivery schedules to provide more realistic and accurate contract schedules.

(5) The problems lengthening PLT's, and inflation, have received considerable high level attention. The Joint Logistic Commanders have chartered an Ad Hoc Committee to define the extent to which increasing PLT's and prices are a universal problem among the services. Action proposed includes reviewing and up-dating PLT's and requirements computations and, where permitted, reflecting the best estimate of full cost by the use of specific data and price level indices. It was obvious that two actions must be taken by the committee if supported elements are to maintain the desired levels of readiness: (1) Budget estimates must be compiled to reflect realistic costs; and (2) Government actions must be initiated that will result in a means of accommodating expanding lead times.

(6) Additional comments on the PLT problem will be made later in the report.

f. Insurance Stockage.

(1) Insurance items are those mission essential items that are not expected to fail and for which demands are not expected but must be stocked, because in the event of failure their nonavailability would significantly impact on the readiness condition of essential end items. Insurance items are

stocked by AMC. As example for the sample end items managed by TACOM is shown in figure 45.

(2) The detailed review of 61 stock numbers identified one item that was identified as an insurance item. In this particular case the item was at zero balance and procurement had been initiated only to cover backorders. The item had a numerical stockage objective of eight, but these eight were not procured. This approach defeats the purpose of insurance stockage and is assumed to be an isolated case.

End Item	Number of Insurance FSN's
Tank, M60A1	336
ARAAV, M551	268
Gun, SP, M107-M110	211
Hoz, M108	413
APC, M113A	36
Trk, 2-1/2 ton	67

Figure 45. Insurance items stocked by TACOM.

(3) Insurance items present two difficult problems-- what to stock and how much. The current AR 710-1 provides little guidance on either subject other than definition and that quantities stocked will not exceed 5 percent of the end item density.<sup>27</sup> The subject of how much to stock has been addressed in greater detail in recent publications<sup>28</sup> and should result in increased availability of insurance items. However, the factors necessary to determine what to stock are not adequately defined at the present time. The definition of an insurance item is subject to differing interpretations. The problem really relates to the question of what parts are essential for the operation of an end item. This particular subject will be discussed in a separate paragraph later in this section.

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27. AR 710-1, op. cit., pages 4-9 and 10.

28. Final draft revision to chapter 4, AR 710-1, op. cit., page 34, and Letter, AMCSU-KP, USAMC, 30 July 1974, subject: Requirements Computation - Numeric Stockage Objectives and Insurance Items.

g. Automated Systems Problems.

(1) In a number of cases (13 out of 61), errors were found in the ALPHA printouts in regard to safety levels, and due-in, due-out, and on hand quantities. In these cases it was necessary for the item managers to manually adjust the quantities to perform a correct analyses. ALPHA is a new system, and, just like SAILS and CS<sub>3</sub>, time is required to work out system problems.

(2) At TACOM, a non-ALPHA NICP, Army requirements and requirements for foreign military supply support agreements (SSA) are computed independently. When either is short or excess, a supply control study is generated for the item manager. In numerous cases shortages in one category were offset by overages in the other, and vice versa. In these cases the item manager would recommend, and rightly so, disapproval of the study recommended buy or cut-back. This situation occurs frequently and creates an unnecessary work load for the item manager. A program routine could be written to compare Army and SSA quantities to preclude the generation of a supply control study when there are offsetting differences.

h. Miscellaneous Probelems.

(1) In one case an item was transferred for inventory management purposes from one NICP to another. Neither stocks, due-in quantities, nor procurement sources were made available to the receiving NICP. This resulted in considerable delay in meeting subsequent demands for the item.

(2) In 4 out of 61 cases, quarterly supply management printouts were not provided to the item managers on schedule.

(3) In some cases (3 out of 61) a contractor's performance was considered unsatisfactory by the procurement analyst; however, a preaward survey conducted by DCAS indicated that the contractor was satisfactory, and the contract was awarded on that basis. It was generally found that the combination of a favorable preaward survey and the low bid settled the question of who was awarded the contract, regardless of other considerations.

(4) Six of the 61 stock numbers reviewed became problems because of stock number changes which resulted in the lack of supply control printouts for an extended period of time. All demands accumulated against the old stock number and resulted in an inaccurate stockage position displayed on printouts for the new stock number. Additional machine time is required to

insure that demands are properly posted, and these procedures were not uniformly applied in all cases.

(5) Some reparable items reviewed (11 out of 61) were being supported by repair and procurement. An analysis of these items revealed that repair was no longer economical. The repair program appeared to be determined on an individual basis by each item manager and not based on uniform criteria. Effective support of some major end items depends to a large extent on timely depot overhaul of on-hand reparable assets. Appropriate application of priorities is essential to insure support of current and anticipated requirements. A recent AMC letter provides guidance for the assignment of priorities and should eliminate a degree of confusion on this subject that was noted during the study team's visits to the NICP's.<sup>29</sup>

(6) In 5 out of 61 cases, quantities held in reserve stocks (not protectable) were not released to satisfy NORS requirements. This occurred despite the fact that the NORS requisitions were passed to the item manager or the materiel readiness office for appropriate action.

(7) Sixteen out of the 61 stock numbers experienced a combination of problems. In some cases the item was at zero balance for a period of time due partially to excessive ALT or PLT. However, contributing factors included a failure to initiate procurement action, delayed procurement due to a lack of funds, or failure to initiate efforts to expedite deliveries.

(8) At several NICP's, in both the Materiel Management and Procurement Directorates, a general problem existed of backlogs and inability to meet periodic surveillance schedules due to reorganization actions, relocation, and personnel shortages. The volume of supply management printouts generated was such that it was impossible for the item managers to review all the documents provided. This situation was further aggravated, in some cases, by reductions in force, which resulted in an increased workload for the remaining item managers. This problem will be relieved when the full potential of the ALPHA system is realized, to include automatically prepared procurement work directives and delivery orders on basic ordering agreements, now scheduled for implementation in January 1976.

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29. Letter, AMCSU-KP, USAMC, 23 September 1974, subject: Assignment of Repair and Procurement Priorities.

#### 4. PROCUREMENT.

a. Delinquent Deliveries. An analysis of AMC contract deliveries of secondary items over \$2500, percentage of on-time deliveries to cumulative value of contract schedules for fiscal year 74, reveals the following percentages of on-time deliveries: first quarter, 81.3 percent; second quarter, 73.0 percent; third quarter 74.1 percent; and fourth quarter, 71.3 percent.<sup>30</sup> These figures show a 10-percent decrease in on-time deliveries from the first quarter to the fourth quarter for the entire AMC complex. Contracts delivered on time based upon original contract delivery schedules varied from 70.1 percent for the first quarter to 58.8 percent in the second quarter, 68.0 percent for the third quarter, and 64.1 percent in the fourth quarter.<sup>31</sup> This performance was based on average delinquency rates since a data base did not exist at all commands from which performance statistics could be obtained. The obvious conclusion is that contract delivery schedules provide only limited assurance of performance. The implications of this problem will be discussed later with the subject of forecasting leadtimes.

#### b. Use of Requirements Type Contracts.

(1) The study team felt that increased use of requirements type contracts could improve repair parts supply. All procurement personnel interviewed agreed that this was the approach to take; however, several problems are preventing increased use of this type of contract. At one NICP the number of stock numbers supported by requirements type contracts actually decreased during the past year, from 877 stock numbers to 637.

(2) A legal problem restricting the use of requirements contracts is the fact the current Armed Services Procurement Regulation (ASPR) restricts the use of this type of contract to commercial or commercial modified items. A second problem is a reluctance on the part of some contractors to sign fixed price contracts due to rising costs and materiel shortages. In the current market some suppliers are not quoting prices but determine the price at the time of delivery. Obviously the Government can't do business this way. This situation discourages prospective contractors from bidding on fixed price contracts when they can't be reasonably sure as to what their costs will be.

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30. HQ, USAMC, IMPACT (Improved Management of Procurement and Contracting Techniques), 2nd Qtr, FY 74, page 1c; and a personal interview at AMC to update recent figures.

31. Ibid., page 1d.



(3) A technique that appears especially useful in the current economic environment is the use of options for additional quantities. There are some limitations on the use of options but these are not particularly severe.<sup>32</sup> Options can be written for additional quantities at unit prices no higher than those for the initial quantities, in which case the option quantity is limited to 50 percent of the original quantity.<sup>33</sup> This is the procedure that was generally followed. Options can also be written which permit a prospective contractor to bid a separate price for the option quantity and the initial quantity.<sup>34</sup> The 50 percent limitation on the option quantity does not apply in this case.<sup>35</sup> Increased use of the second technique would appear to offer benefits to the government. In view of current economic conditions, this technique would attract more competent contractors, allow them to bid realistic prices, and eliminate recurring administrative leadtime procedures that result from repetitive procurements.

c. Preaward Surveys. Preaward surveys are used extensively and provide a means to judge the probable ability of a prospective contractor to satisfactorily accomplish the contract in question. However, it was noted on occasions that the opinion of AMC procurement and/or production personnel differed from the opinion expressed in the DCAS preaward survey. The preaward survey carries considerable weight when it comes time to award the contract. It was generally found that, on a competitive procurement, the combination of the low bid and a favorable preaward survey will insure the award of the contract to the contractor concerned. Conversation with a number of AMC people indicated the need for increased emphasis by DCAS on surveys to insure a more positive determination as to the contractor's capability, particularly in the area of meeting proposed delivery dates.

d. Premium Pay. Two of the AMC NICP's visited were using an incentive delivery method called premium payment to reduce lengthening PLT. While this was designed to offer the contractor compensation for any additional cost that early or even on-scheduled delivery might cause, this method may or may not tend to cause the contractor to delay delivery in order to take advantage of this additional payment. This method of dealing with some contractors had proven effective; however, it has not been given wide spread support and was not used to any degree at the other NICP's. The study team does feel that this approach is an acceptable solution to the leadtime problem.

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32. Armed Services Procurement Regulation, General Provisions, Para 15 - Options, page 1:187, paragraph 1-1503.

33. Ibid., page 1:188, paragraph 1-1504.

34. Ibid., page 1:187, paragraph 1-1503

35. Ibid., page 1:188, paragraph 1-1504.

e. No Bids on Competitive Procurements.

(1) There has been a noticeable decrease in response to firm fixed price solicitations. At one NICP, 743 abstracts of bids were reviewed and it was found that the no bid situation occurred 3 percent of the time. This is not a high percentage but when this situation occurs it is a serious problem. This situation occurs for a variety of reasons. The principle ones are a reluctance on the part of contractors to sign fixed price contracts due to current economic conditions and the greater profitability of commercial business.

(2) In a recent informal survey of 20 contractors who expressed an intent to discontinue doing business with the Government, 35 percent stated the reason as being "Government business not profitable," 15 percent stated they were losing money; 20 percent stated that commercial products were more profitable and future sales could more readily be determined.<sup>36</sup> Although this survey cannot be considered as representative of the entire industry viewpoint, there is justification for suggesting that there is a trend of dissatisfaction among contractors.

f. Defense Production Act of 1950.

(1) This law provides for the establishment of legal means whereby contractors can be compelled to provide needed goods and services under the Defense Materiel System and Defense Priorities System. Appropriate directives are issued under the provisions of this Act to contractors by the Department of Commerce. Noncompliance with these directives is punishable by fine and/or imprisonment. These provisions have not been used to any extent to alleviate long leadtimes and no bid situations, primarily as a result of a lack of knowledge of these provisions and clear implementing instructions. There did not appear to be any case, in the group of items reviewed during this study, where the provisions of this Act had been invoked to relieve the no bid or contract delinquency problems noted.

(2) One detailed problem that was noted on this subject was that the defense priority code is sometimes not perpetuated on subcontracts. When this occurs the subcontractor has the defense of not knowing that he is supplying materiel for a Government contract.

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36. Proposed speech to be presented by BG Hardin to the first annual ARMCOM Industrial Conference, pages 8-9.

(3) It is recognized that implementation of this law might create a degree of ill will between industry and Government. However, greater education of the provisions of the law and judicious application could prevent or resolve some of the more serious parts problems.

#### 5. STOCK FUND MANAGEMENT.

a. A problem that was voiced by several people at the commodity commands (quite strongly at one command) was the lack of full annual funding of the stock fund. The present system of funding the stock fund in quarterly increments creates a number of problems in both supply management and procurement.

b. The Army Stock Fund (ASF) has an extremely important impact on stock availability and backorders. If an item reaches the reorder warning point and a procurement work directive is not released due to the lack of funds, all else being equal, that item will go into a zero balance condition. Since total fiscal year funds are not received at the beginning of the year, the procurement of some items is deferred and in retrospect (at the completion of the year) it can be seen that this often was unnecessary.

c. In addition, the present system results in repetitive procurements for the same item, which increases the volume of work for the procurement activities, and prevents large quantity buys which generally result in a price advantage to the government and are more attractive to industry.

d. It must be recognized, however, that there is another side to the question. Incremental funding does have the advantages of requiring periodic examination of requirements and priorities, and precludes the possibility of an activity running out of money as a result of the commitment of an entire year's funds early in the year.

e. AMC headquarters is fully aware of the problems caused by incremental funding. The problem is to convince higher headquarters.

#### 6. FABRICATION OF REPAIR PARTS.

a. Fabrication was not an area of major interest in this study but the subject came up in discussions of long leadtimes and no bid situations. AMC has a limited fabrication capability and whether or not this capability should be expanded was not resolved in this study. At the present time the study team is not aware of an on-going or planned study on fabrication within AMC.

b. In those cases where no bids are received on a solicitation, it appears that only two options remain, other than a new solicitation or a negotiated procurement, and they are to fabricate the item or use the provisions of the Defense Production Act of 1950.

7. MILITARY LIAISON PROGRAM. Visits to the AMC commodity commands revealed that two of these commands had what appeared to be a very effective military liaison program. This program is in addition to the Logistics Assistance Office program and technical representatives which AMC had had for some time. The military liaison program involves the use of commodity command officers, primarily field grade, to conduct periodic visits to Army divisions and installations for the purpose of resolving supply and maintenance problems. The most significant feature of the program is its informal nature, in the sense that it is not conducted through command channels, which assists in establishing a productive working relationship between the parties concerned. The study team observed, however, that considerable variance existed between the programs from one command to another. The study team concluded that additional emphasis on this program from AMC headquarters would be beneficial. It should be noted that none of the foregoing comments apply to MICOM since that command was not visited.

#### 8. REQUISITION FOLLOWUPS.

a. The problem with followups was identified during discussions with AMC headquarters personnel. The problem was that followups sometimes reach the NICP prior to the requisitions themselves. It is understandable how this can happen since followups for high priority requisitions are submitted 48 hours after the requisitions.

b. The provisions of AR 725-50 prior to the publication of the latest revision handled this situation as follows:

Processing points in receipt of followup for which there is no record of receipt of the original requisitions will process the followups as requisitions. This will be accomplished by changing the followup document identifier code to the appropriate document identifier code within the "A" series and following the normal processing routine for requisitions.<sup>37</sup>

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37. Department of the Army Regulation 725-50, C34, Issue of Supplies and Equipment; Requisitioning, Receipt, and Issue System, October 1969, page 4-31.

It is the study team's opinion that this is the logical procedure to follow. It is a reasonable assumption that requisitioners followup on requisitions because they want the item they requisitioned.

c. Major changes in followup procedures are reflected in the most recent edition of AR 725-50, and unfortunately, the new procedures have complicated the subject to the disadvantage of the customer.<sup>38</sup> There are now two different followup procedures. The document identifier code (DIC) AF may be used, which, in the event this card reaches the NICP prior to the requisition, creates a no record status (BF) and results in rejecting the requisition when it is received. The use of DIC AT will establish a requirement if the followup is received prior to the requisition. The problem with the DIC AT is that its use can result in double shipments, because of the requirement established by the AT followup and the duplicate requirement established when the original requisition is received.

d. The disturbing point in the new AR 725-50 is that the requisitioner must choose whether to use the DIC AF or DIC AT, and the responsibility for double shipments and billings, if they occur when he uses a DIC AT, is his.<sup>39</sup>

e. It is the opinion of the study team, that there should be one DIC for a followup and that followup should be treated as a requisition if the requisition has not been received. Requisitioners followup because they want the materiel, otherwise they would request cancellation.

f. Before the above can be accomplished a solution must be found to the problem of double shipments. It is hoped that AMC ADP programs can be revised to accomplish this objective. AMC is in agreement, in principle, with the QMS and is currently attempting to develop the procedures required to prevent double shipments. It should be noted that AR 725-50 currently requires that this be done; "The AT-series followup document, however, will be processed as a requisition only after a thorough review has been made to preclude a duplicate shipment."<sup>40</sup>

## 9. FORECASTING PRODUCTION LEADTIMES.

a. The problems of ALT and PLT have previously been discussed. Problems exist in both areas but the most serious problem is PLT. AMC and higher headquarters are well aware of the problems which result from extended PLT's and thus far this study has only added documentation to a well known problem.

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38. AR 725-50, Op. Cit., pages 3-15 and 16.

39. AR 725-50, Op. Cit., page 3-16.

40. AR 725-50, Op. Cit., paragraph 4-49(2), page 4-22.

b. There are, however, two aspects to this problem. A review of selected stock numbers revealed a number of cases where item managers were not using the latest available lead-time information in their inventory policy. Assuming funds are available, this problem can be resolved by greater coordination between procurement and production personnel and item managers. The second part of this problem is more difficult, and that is, how should leadtimes be determined? Currently NICP's can use the average time from the date of the contract to the date of receipt of the first significant delivery,<sup>41</sup> or the time involved as of the last signed contract based upon the contract delivery schedule.<sup>42</sup> Both of these concepts have deficiencies, particularly the idea of using the last signed contract. It was shown in paragraph 4a, Delinquent Deliveries, that a contract delivery schedule is no guarantee of performance.

c. Current policy is one of reaction to changes in PLT. It is the study team's opinion that the only way to get ahead of the situation is by using reasonably accurate forecasts. This is not an original idea, AMC has attempted to obtain approval from the DOD to use forecasts but has not been successful. Perhaps a stronger case is needed. A believable methodology must be developed and it should be explained that using forecasts does not necessarily mean spending more money. It does in the current economy because leadtimes have been increasing. However, in a declining economic environment, forecasting can save money due to reduced commercial business, which would make Government business more attractive and competitive, and would likely result in punctual or even early delivery.

d. The QMS is aware of two AMC study efforts on this subject. The first was conducted in 1972.<sup>43</sup> The approach used in that study was stepwise regression analysis. The results were an improvement over the then current procedures but significant forecast error remained. The second study is currently in process. AMC's Inventory Research Office began a study in September 1974, concerning forecasting PLT and price changes. TACOM and ECOM data are being used, and the study is scheduled for completion by January 1975.

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41. Final draft revision - Chapter 4, AR 710-1, Op. Cit., page 28.

42. Interview with several sources at HQ AMC.

43. Inventory Research Office, Production Lead Time Forecasting, January 1972.

e. Although AMC is studying this area, some thoughts on the subject will be presented for consideration. An observation that was made in this study was that in many cases the NICP's have considerable experience with certain contractors. Using the assumption that past performance is a reasonable guide to the future, experience with a contractor can be used to predict deliveries from a new contract, regardless of what the contract states concerning delivery date, and this predicted time can be used in inventory policy.<sup>44</sup> This concept is illustrated in figure 46 by the use of a very simple numerical example.

(1) Category	(2) Number of Contracts	(3) Months Late	(4) Total
1	3	0	0
2	1	2	2
3	1	4	4
4	1	1	1
Totals	6	7	7
Average lateness = 1.2 months			

Figure 46. The concept of average lateness using the performance record of a fictitious contractor.

In the above example average lateness was computed by multiplying each element in column 2 by the corresponding element in column 3, totaling column 4, and dividing by the total number of contracts. Based upon his past performance one can expect this contractor to be late on delivery by 1.2 months. This time, then, 1.2 months, could be added to the production lead-time as determined by a new contract with the contractor, for inventory PLT purposes. This example only illustrates the concept of using average lateness. A confidence level could also be computed to determine the lateness to be expected at a given level of probability. For example, using the data in figure 46 and the student's "t" distribution, one can say with 90 percent confidence that deliveries from this contractor will not be more than 2.85 months late.

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44. It is helpful to recall at this point that delivery schedules provide, at best, an estimate of actual delivery. As of the 4th quarter of FY 74 only 64.1% of the value of AMC's contracts for secondary items were delivered on time based upon original delivery schedules.

f. The statistical approach explained above should be modified if specific facts are known which differ in the current situation from what they were in the past; such as, materiel availability, the contractor's backlog or lack thereof, and his labor situation.

g. The problem becomes more difficult when a procurement directorate does not have experience with a contractor or it has been a long time since a buy has been made. In this case it may be necessary to rely on analogy or industry trends in the particular commodity area. A detailed methodology for this situation has not been developed for this report. However, a major consideration in any forecasting situation is the availability of data which can be manipulated for forecasting purposes. Fortunately, there are numerous sources of leadtime information; for example, contractors themselves. Procurement personnel should be able to informally survey potential sources for leadtime information. DCAS should also be able to assist with leadtime data. In addition, there are numerous trade associations which can or could provide input. An example of information that is readily available is "Purchasing Magazine." This magazine has been conducting a monthly survey of producers of a large variety of commodities and finished products for leadtime information. A three line example of the results is shown in figure 47.

STEEL	1-5 weeks	6-10 weeks	11-30 weeks	21-30 weeks	over 30 weeks
Plate	24%	24%	42%	5%	5%
Tool Steel	38%	25%	25%	0	12%
Steel castings	0	0	50%	17%	33%

Figure 47. Example of leadtime information available in Purchasing Magazine.

SOURCE: Purchasing Magazine, "Leadtimes," August, 1974, page 17.

Figure 47 shows the percentage of respondents who reported leadtimes in the time intervals shown. Only three lines are shown in the example. The August report presented data for 125 products.

h. All of the above discussion has been presented from the standpoint of increasing leadtimes. The same concepts apply for periods of decreasing leadtimes.



i. Although the complete methodology for forecasting has not been developed in this report it is hoped that the thoughts expressed will be of assistance to AMC and that AMC will pursue the subject in sufficient detail to implement forecasting techniques.

#### 10. REPAIR PARTS ESSENTIALITY.

a. It was found that the concept of essentiality was not used in day-to-day management of repair parts. This would not be important if unlimited funds were available which, of course, is not the case. Not all repair parts are equally important and limited funds should be applied to the more critical items. Another consideration is that if leadtimes are forecasted (which is recommended in this study), it will probably be found that a considerable expenditure of funds will be required to adjust inventory policy to reality. The attempt to do this should be made; however, being realistic, it is unlikely that all of the money needed will be received. Therefore, a criterion is needed to establish priorities for funds. Whether it's called essentiality or some other term isn't really important, but a procedure is needed to obtain the largest possible payoff to combat readiness. The procedures currently being used do not really get to the heart of the matter. For example, at one NICP the following techniques are considered when the command is faced with a shortage of funds:

- (1) Factor the requisitioning objective.
- (2) Intensively manage high dollar items.
- (3) Reduce safety levels.
- (4) Defer procurements.
- (5) Process procurement actions up to the award point and hold until 1 July.
- (6) Use the lowest demand of the last 6, 12, or 24 months.

With the exception of item (2) the above techniques are rather arbitrary. These practices cannot be condemned, however, because in the absence of a reliable criterion of essentiality, or some other priority system, these are probably the best techniques that can be used.

b. The idea of essentiality is probably the best concept to pursue. AR 700-18 provides for essentiality coding during

provisioning and defines the codes that will be used.<sup>45</sup> The regulation does not explain how essentiality is to be determined, and the study team was unable to find in the literature specific guidance on procedures to determine essentiality. As it stands now, essentiality is determined by the judgment of maintenance engineering personnel and in some cases contractors.<sup>46</sup> Additional problems are that essentiality codes are not revised and contain a number of obvious errors. There does not appear to be a simple way to handle this problem, and it will take the best efforts of all concerned to find a solution.

c. Several recent efforts in this area have been made or are in process.

(1) The Logistics Center (LOGC) is working on the problem for selected items of equipment using primarily the Delphi technique. The principal purpose of this effort is to develop PLL's and ASL's. The project is not completed, so no statement as to the success of the program can be made at this time.

(2) The Maintenance Management Center was working on a similar project earlier in 1974 using the Army Equipment Records

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45. AR 700-18, Provisioning of US Army Equipment, Sep 73, table 4-1 provides the following essentiality codes.

<u>Code</u>	<u>Definition</u>
H ....	A support item, the lack of which renders the supported system or end item or other supported item inoperable.
S ....	A support item not qualified for the assignment of code "H," but which is needed to --
(1)	Satisfy legal, climatic, or other requirements peculiar to the planned operational environment of the supported item.
(2)	Minimize or eliminate a safety hazard to the operator or crew of the supported item.
(3)	Preclude the creation of a hazardous condition within the vicinity of the supported item.
(4)	Prevent the impairment of or the temporary reduction in the effectiveness of operation of the supported item because of a lack of servicing items (e.g., oil and air filter elements of filters).
L ....	A support item not qualified for assignment of codes "H" or "S."

46. Department of the Army Regulation 700-18, Provisioning of US Army Equipment, September 1973, page 4-1.

System data and demand data. The project was called CASL, Contingency Authorized Stockage Lists, and the criterion of essentiality was to be developed to determine stockage to support contingency plans. This project has been suspended pending the outcome of the LOGC effort.

(3) General Research Corporation (GRC) recently completed a study entitled, "Supply Policies and Equipment Readiness; a Study of Selected Units and Weapons Systems."<sup>47</sup> In this study GRC touched on the subject of essentiality and suggested using the information on the back of the DA Form 2406, Unit Readiness Report. The fallacy of this concept is that the 2406's are incomplete and tell us nothing about the essential parts that are being supplied effectively.

d. The problem, it appears, is that to solve the problem will require an extensive study effort; and, if one believes the information concerning the outlook for money that is heard from Washington, the Army needs a priority system now or will need one in the very near future. With that thought in mind a QMS proposal is presented that, although not the final solution, would provide an early payoff.

e. First, a priority system is needed for end items. A starting point could be the currently assigned operational readiness rates (ORR). The problem of two or more items having the same ORR could be resolved by a work group consisting of representatives from DA and the major Army commands. This would only be a starting point, but if nothing further was done the Army would at least have a ranking system to indicate when limited funds should be used if all the money needed can't be obtained.

f. Prior to looking at specific parts, agreement would have to be reached on whether or not the current definitions of essentiality are adequate. The study team suggests that the H code be redefined as follows: A repair part or assembly, the lack of which prevents the supported system or end item from performing its combat, combat support, or combat service support function. The emphasis is somewhat different than in the current definition.

g. In regard to specific parts, AMC commodity commands could research current zero balances with backorders to identify those with NORS and/or high priority requisitions. These would be considered candidates for H coding and full support from the

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47. Karadbil and Foohey, Op. Cit.

standpoint of funding. AMC would then make an analysis of these parts as to essentiality. The analysis would be based upon maintenance engineering factors and judgment. Once this is completed AMC would pass the list to the US Army Logistics Center (LOGC). The LOGC would make an independent analysis as to essentiality in coordination with the Army service schools. Parts jointly agreed upon as being essential would be fully supported from the standpoint of funds and realistic inventory policy. This may or may not require additional funds. If it does, it will be necessary to develop trade-offs, assuming there is a fund shortage. This can be done by creating money for an essential part by robbing it from a less essential part; for example, reducing or eliminating the safety level for the less essential part. The question as to what parts are non-essential or less essential would be determined by independent AMC and LOGC analysis, by end item, and then meetings to resolve differences. This process would continue to the point where no additional nonessential parts can be identified, or to the point where all of AMC's zero balances are for nonessential parts.

h. As was seen from the discussion of essentiality in section I there are indications that the majority of essential parts are already demand supported. The follow-on action for demand supported parts identified as essential by the process just described would be to review inventory policy and safety levels in view of actual experience and adjust inventory policy as required to insure (within reasonable limits) that stockage is maintained. For those parts not demand supported, insurance stockage would be established at the commodity command level.

i. Due to the magnitude of the task, AMC has approximately 10,000 FSN's at zero balance (see figure 43), it would be advisable to conduct a pilot project to determine the probable time and manpower required to accomplish this project.

j. The only current effort on essentiality known to the study team is the LOGC project. The major objective of the LOGC program is to develop PLL's and ASL's. The major objective of the QMS proposal is to get critical parts stocked at the wholesale level. The basic premise is that if the part is not available at the wholesale level, it really doesn't matter what is done at any lower level. The proposal also has the advantage of immediate implementation starting with those parts that are currently in trouble.

## 11. FINDINGS.

a. Zero balances range from 1.4 percent to 13.6 percent for the five NICP's visited. Of greater importance than the percentages of zero balances is the length of time that parts

remain at zero balance. In a 13-month interval, considering all AMC NICP's, 83 percent of the parts that were at zero balance at the beginning of the period were still at zero balance at the end of the period. The challenge to management is to prevent zero balances rather than react to them after they occur.

b. Current AMC wholesale inventory policy is geared to matching demand accommodation to the assigned weapons system/end item operational readiness rate. This is a significant improvement over the use of fixed add and delete criteria; however, demand accommodation in itself does not indicate how well the customer is supported. Demand satisfaction is a better measure of customer satisfaction, and it was found that for all commodity commands visited demand satisfaction was less than 85 percent.

c. The repair parts which related to the 14 end item sample were supplied by three of the AMC commodity commands. Status and status dates obtained from the NICP's indicated that a large percentage of the completed requisitions had a no record (BF) status at the supporting NICP. This indicates that these requisitions were filled by the installation supporting the division (assuming the NICP history files are 100 percent correct). If this is the case the retail level has a serious processing problem, since OST for completed requisitions with a no record status range from 29.3 to 43 days.

d. The processing times for the open requisitions for the sample end items show excessive periods of time from the document date to the sample date and a large percentage of no record requisitions. This indicates that units are waiting for parts which they will never receive.

e. AMC item managers files were reviewed for 61 stock numbers selected from the repair parts sample to determine the reasons for parts getting into bad stockage positions. The major reasons found were lack of agreement between actual requirements and the ALT and/or PLT used in inventory policy. A number of these difficulties resulted from failure of the item managers to use data available from the procurement directorates. Safety levels were a problem in some cases and were either excessive or inadequate. The lack of requirements determination time and RDT quantities has been a problem but it may be resolved since DOD has provided verbal authority to use RDT. Additional funds, however, have not yet been provided for RDT. In addition to the foregoing, a number of miscellaneous problems were identified which contribute to zero balances.

f. In the procurement area by far the greatest factor contributing to zero balances is delinquent deliveries on contracts. Whether or not additional emphasis should be placed on defaulting contractors for late delivery is a debatable subject; however, this study indicates that the general procedure is to revise delivery schedules rather than initiate default procedures.

g. Increased use of requirements type contracts would appear to be an effective way to improve repair parts supply; however, there are a number of factors which limit the use of these contracts. The most serious is the current state of the economy which makes contractors reluctant to bid on fixed price contracts. A suggestion which may help is to increase the use of options for additional quantities and allow the bidders to bid separate prices for the initial quantity and the option quantity.

h. Increased use of preaward surveys would appear to be a means for improved contractor performance; however, it was found that this is already a general practice. The need for increased emphasis is indicated in this area, not from a quantity standpoint, but rather from a standpoint of quality, particularly in the area of the contractor's ability to meet scheduled delivery dates.

i. It was found in some cases that no bids were received in competitive solicitations. A sample at one command indicated that this situation occurred approximately 3 percent of the time. Although this is not a high percentage it is a serious problem when it occurs. Outside of a new solicitation or a negotiated contract, few options remain. Fabrication is one option, but little effort was devoted to this subject in this study. Another option is to use the provisions of the Defense Production Act of 1950 to obtain contractor response. No evidence was found indicating that this Act was used for any of the parts examined in this study. This indicates the need for increased publicity and use of the provisions of the Act.

j. The management of the Army stock fund requires examination. The current procedure of allocating funds on a quarterly basis rather than yearly results in deferment of purchases which, in retrospect, could have been made and in repetitive procurements which increase the workloads of the procurement directorates. It also prevents large quantity buys, which are generally more attractive to industry and which result in price advantages to the Government.

k. Several of the commodity commands are using military officers to make routine liaison visits to installations and

divisions to resolve supply and maintenance problems. The approach appears to be productive but there is considerable variance in the liaison programs from one commodity command to another.

l. Requisition followups have been identified as a problem as a result of recent changes to AR 725-50. The system has been complicated and works to the disadvantage of the customer. The customer has the choice of using a document identifier code (DIC) AF which will reject the requisition if the followup precedes the requisition, or a DIC AT which will establish the requirement if the followup precedes the requisition, but will also accept the requisition, which may result in a double shipment. It seems logical that only one system is needed and it should establish a requirement if the requisition has not been received.

m. Forecasting of production leadtimes is not being accomplished and this appears to be the only procedure which will alleviate the discrepancies between contractor performance and the leadtimes used in inventory policy. AMC is currently studying this subject and several ideas have been presented in this report.

n. It was found that the concept of repair parts essentiality is not used in day-to-day supply management decisions. The concept of essentiality needs to be refined to provide a means of allocating scarce resources. Although some effort has been, and is being, expended on this subject, an acceptable procedure has not yet been developed to determine essentiality. A QMS proposal on essentiality is presented in the discussion, which although not an optimum solution, provides for an early payoff, starting with parts that are currently in trouble, AMC's zero balances.

## Chapter 3

## CONCLUSIONS

1. Order and shipping times for high priority requisitions are excessive when compared to published standards, and indicate problems in document processing and zero balances. See chapter 2, section 1, para 1 and 3.
2. The validity of the 5,000-line objective specified in AR 710-2 for a maintenance battalion is questionable. Supply performance in the sample divisions was below regulatory standards, and full compliance with the 5,000-line objective may further decrease performance. See chapter 2, section 1, para 2a.
3. Inventory accuracy at the division level needs to be improved. The sample inventory conducted by the study team revealed inventory accuracy of 43.9 percent. One problem identified is that written guidance on physical inventory procedures is fragmented among a number of publications. The QMS is in the process of preparing a training circular to fully explain physical inventory procedures. See chapter 2, section 1, para 4a.
4. Cancellation procedures at the unit and DSU need to be improved. This is based upon the volume of cancellations, the length of time between the document date and the request for cancellation, and the fact that 25.9 percent of sample division ASL requisitions and 32.5 percent of NSL requisitions for parts which were canceled were actually shipped. See chapter 2, section 1, para 5.
5. Receipt procedures need to be improved at the DSU level. The study revealed that in some cases DSUs are waiting for parts which they have already received. See chapter 2, section 1, para 6.
6. Prescribed load list clerks need additional training. This conclusion was based upon analysis of a questionnaire and MOS test results. See chapter 2, section 1, para 7.
7. Procurement leadtimes used in inventory policy are often not in agreement with actual conditions. See chapter 2, section II, para 3, and appendix G.
8. Requirements determination quantities are not being computed and stocked, AMC recently received verbal approval from DOD to use requirements determination quantities; however, additional funds have not been provided. See chapter 2, section II, para 3 and appendix G.



9. An increased capability within AMC for in-house fabrication of repair parts may be required. See chapter 2, section II, para 6.

10. The Defense Production Act of 1950 is only being used to a limited extent to resolve unacceptable leadtime problems or those situations where no bids are received on a competitive procurement. See chapter 2, section II, para 4f.

11. AMC commodity commands have established military liaison programs to make routine visits to divisions and installations; however, there is considerable variance in the programs from one command to another. See chapter 2, section II, para 7.

12. AR 725-50 has complicated followup procedures to the disadvantage of the customer. See chapter 2, section II, para 8.

13. The current policy for determining production leadtimes has resulted in understated requirements in many cases. See chapter 2, section II, para 3e and 9.

14. The methodology for determining essentiality needs to be refined and parts need to be examined for proper coding to provide a priority system for the expenditure of limited funds. See chapter 2, section II, para 10.

## Chapter 4

### RECOMMENDATIONS

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1. Recommend that portion of para 7-6b, C3, AR 710-2, 8 August 1975, which applies to a maintenance battalion be deleted; and para 3-27b(1)(a) and (b) be changed as follows: (a) Additions to the Authorized Stockage List (ASL) (fig. 3-49). Normally a demand criteria of six demands in the most recent 360-day period will be used to add an item to the ASL. Installations authorized to operate in accordance with the Economic Inventory Policy (EIP) will be governed by the procedures established in paragraph 3-31. Figure 3-9 consists of EIP stockage tables which are designed to provide an economic yet reasonable demand accommodation of 80 percent. (b) Deletions from the Authorized Stockage List (ASL) (fig. 3-49). When an item qualifies for inclusion on the ASL, it will be retained and reviewed for quantitative adjustment only for a period of 1 year (360 days). One year from the date the item was added to the ASL, the item must have experienced three or more demands within that year to be retained. This criteria is applicable to all subsequent reviews.
2. Recommend that if Department of the Army desires to control the size of ASLs, that this be accomplished by determining the effects of various stockage policy changes followed by appropriate changes to AR 710-2 (add/delete criteria and appropriate goals for demand accommodation and satisfaction). Refers to conclusion 2.
3. Receipt procedures are adequately covered in current guidance; however, it appears that additional command emphasis is needed in this area. A letter will be written to FORSCOM by the QMS with a recommendation to emphasize this subject to CONUS units (refers to conclusion 5).
4. Recommend that the Training Extension Course (TEC) prescribed load list program be made mandatory training for division PLL clerks. As a part of this program additional on-the-job training should be provided covering the subject of local procedures. This recommendation will be formally submitted to FORSCOM by the QMS (refers to conclusion 6).
5. Recommend that AMC commodity commands review internal procedures to insure that maximum coordination is achieved between procurement and production personnel and item managers on the subject of procurement leadtimes (refers to conclusion 7).

6. Recommend that AMC take necessary action to budget for requirements determination quantities and change the applicable portions of AR 710-1 which currently do not permit the use of requirements determination time (refers to conclusion 8).
7. Recommend that AMC publicize the provisions of the Defense Production Act of 1950 and apply the provisions of the law and the Defense Priorities System as appropriate (refers to conclusion 10).
8. Recommend that AMC develop the necessary ADP procedures to prevent the possibility of double shipments when a document identifier code AT followup is used by a customer. Upon completion of this action recommend that Chapter 3, section VIII, AR 725-50, be rewritten to provide for the use of one document identifier code for requisition followups, with the provision that the followup be treated by the supplier as a requisition if the requisition has not been received (refers to conclusion 12).
9. Recommend that AMC continue its efforts to develop the methodology for forecasting production leadtimes (refers to conclusion 13).
10. Recommend that the QMS suggestion concerning essentiality and essentiality coding; explained in chapter 2, section II, para 10; be jointly implemented, on a pilot project basis, by HQ AMC and the LOGC (refers to conclusion 14).

APPENDIX A

US ARMY, EUROPE AND SEVENTH ARMY  
FEBRUARY 1974 REPORT OF  
SUPPLY ACTIVITY

ROSA FEBRUARY

(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(PCS-AEAGD-322-(R11))

PAGE 01

UNIT IDENTIFICATION	STOCKAGE LIST LINES	MSL	ACTION ON REQUESTS RECEIVED AT DSU'S	DESIGNATION	000	AAC	TOTAL	NUMBER AT EXCESS ON HAND	NUMBER ON ZERO BALANCE	DSU ASL (X OF ASL)	NUMBER OF REQUESTS RECEIVED	NUMBER OF REQUESTS REJECTED (AND X)	DEMAND ACCOMMODATION (AND X)	DEMAND SATISFACTION (AND X)	ORDER ESTIMATED
3RD ARM DV TOTALS		668	36251								945	2.6 X	24798	19061	9
8TH INF DV TOTALS		1363	22784								686	3.0 X	15887	11456	133
V COSCOM TOTALS		1333	37010								2482	6.6 X	24686	19982	3113
V CORPS TOTALS		3369	90441								4131	6.2 X	85544	49444	3277
1ST ID FWD TOTALS		100	3681								6	.2 X	2014	1425	249
3RD INF DV TOTALS		233	25406								4885	18.3 X	12416	11391	199
1ST ARM DV TOTALS		3626	23615								1150	4.8 X	16759	11626	3125
2D SUPCOM TOTALS		3161	59271								3660	6.1 X	36600	26881	7961
VII CORPS TOTALS		7120	112143								9473	8.4 X	70789	51323	13850
36 PA BDE TOTALS		1743	1457								25	1.7 X	442	342	215
32D AADCOM TOTALS		5552	17506								596	3.4 X	11740	10060	2568
7TH ARMY TOTALS		18160	236626								14545	6.1 X	155070	116522	20588
DATA DELETED PER HQ USAREUR MISO LTR AEACH-D,OTD 5 MAR 70															

[illegible]

UNIT IDENTIFICATION STOCKAGE LIST LINES NSL ACTION ON REQUESTS RECEIVED AT DSUMS  
 DESIGNATION DOD TOTAL NUMBER AT EXCESS ON NUMBER REQUESTS DEMAND ORDER  
 AAC ON ZERO BALANCE HAND OF LINES RECEIVED REJECTED ACCOMMODATION SATISFACTION ESTMO  
 DSU ASL (X OF ASL) (X OF ASL) ON HAND (AND X) (AND X)

SEVENTH ARMY 7TH AR MISC

7A TNG CEN AK4002 8445 777 9.2 X 833 9.8 X 377 9079 320 3.5 X 6555 74.8 X 5153 78.6 X 654

440 SC BN AK4249 NO REPORT RECEIVED

FIFTH CORPS V COR MISC

7A ENG BRG AK4885 440 51 11.5 X 4 9.9 X 4 396 30 9.5 X 173 48.3 X 145 83.8 X 22

**PAGE 04**

SEVENTH ARMY  
7TH AVIATION

FIFTH CORPS  
V COR MISC

001 001 001



ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-382-(R11))

PAGE 05

UNIT IDENTIFICATION STOCKAGE LIST LINES NSL ACTION ON REQUESTS RECEIVED AT DSU'S

DESIGNATION DOD \* TOTAL NUMBER AT EXCESS ON \* NUMBER \* REQUESTS DEMAND ORDER  
AAC \* ON ZERO BALANCE HAND \* OF LINES \* RECEIVED REJECTED ACCOMMODATION SATISFACTION EST-D  
\* BSU ASL (% OF ASL) (% OF ASL) \* ON HAND \* (AND X) (AND X) (AND X)

## FIFTH CORPS 3RD ARM DV

503 S&T BN AK4282 1038 243 193 5743 13 5441 5407 9  
23.4 X .2 X 94.8 X 99.3 X

HQ CO A AK4282 5029 557 171 458 29896 889 19129 12508  
9.8 X 3.0 X 2.9 X 65.3 X

CO B AK4283 PERFORMANCE DATA CONSOLIDATED WITH AK4282 INPUT

CO C AK4354 PERFORMANCE DATA CONSOLIDATED WITH AK4282 INPUT

CO D AK4368 PERFORMANCE DATA CONSOLIDATED WITH AK4282 INPUT

CO E ACPT AK4286 988 18 3 1 516 37 220 140  
1.8 X .3 X 7.1 X 65.7 X 63.6 X

509 ORD DT AK4264 353 35 10 94 6 6 6  
9.9 X 2.8 X 6.3 X 9.0 X 75.8 X

122 MN BN TOTALS 6970 610 678 30508 932 19357 12684  
8.7 X 3.0 X 65.4 X 65.3 X

3RD ARM DV TOTALS 608 36251 948 24788 18041 9  
70.2 X 72.8 X

ROSA FEBRUARY

ACTION ON CURRENT MONTH REQUISITIONS SUBMITTED TO USAMAE  
(BASED ON DATA ON CURRENT MONTH REQUISITIONS CO FILED FROM THE USAMAE DCF)

PAGE 06

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UNIT IDENTIFICATIONREQUISITIONS SUBMITT D* REQUESTIONS REJECTED * MATERIEL * * EXTRACT TO COMUS
* TO USAMAE * * RELEASE ORDERS * *
DESIGNATION DOP * TOTAL * NUMBER *NUMBER CODE CODE CODE CODE * DOLLAR *BACK * TOTAL * PRIORITY
AAC * * PRIORITY *REJECT CA CG CG CG CG * * VALUE *ORDERS * *
* 01-03 04-09 01-09ANDX * * * * *
* * * * * 01-03 04-08
* * * * *

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FIFTH CORPS 3RD ARM DV

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803 S&T BN AK4292 551 27 33 30 18 5 1 3 205 751894 30 292 2 7
4.9X 5.9X 10.8X 3.2X

MO CO A AK4282 9391 935 1060 1995 394 50 154 23 13 2 9238 9844123 39 3888 138 257
9.9X 11.2X 21.1X 4.1X

CO E ACFT AK4286 308 58 59 117 8 4 2 1 1 180 213934 3 128 17 10
18.8X 19.1X 37.9X 2.5X

509 ORD DT AK4264 104 59 14 73 6 1 3 40 92 27 11
56.7X 13.6X 70.1X 5.7X

122 MN BN TOTALS 9803 1052 1133 2188 408 55 159 24 14 2 9438 9058202 51 4007 182 278
10.7X 11.9X 22.2X 4.1X

3RD ARM DV TOTALS 10354 1079 1166 2245 426 55 184 25 17 2 9693 9009786 91 4356 184 285
10.4X 11.2X 21.6X 4.1X

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ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

IRCS-AEAGD-322-(R1))

PAGE 07

UNIT IDENTIFICATION		STOCKAGE LIST LINES		NSL		ACTION ON REQUESTS RECEIVED AT DSU/MS		BACY	
DESIGNATION	DOD	AAC	ON	TOTAL	NUMBER AT EXCESS ON HAND	NUMBER OF REQUESTS RECEIVED	NUMBER OF REQUESTS REJECTED	DEMAND ACCOMMODATION	DEMAND ORDER
					(% OF ASL)	(% OF ASL)	(AND X)	(AND X)	(AND X)
FIFTH CORPS									
8TH INF DV									
8 SGT BN	AK4129	982	79	180	2014	354	938	788	133
			8.0 X	18.3 X		19.5 X	57.0 X	84.0 X	
HO CO A									
	AK4385	5426	1098	70	1090	292	14734	10520	
			20.2 X	1.2 X		1.4 X	73.0 X	71.3 X	
CO B ACFT									
	AK4555	705	135	98	355		170	132	
			16.9 X				67.8 X	77.6 X	
CO C									
	AK4393								
PERFORMANCE DATA CONSOLIDATED WITH AK4385 INPUT									
CO D									
	AK4394								
PERFORMANCE DATA CONSOLIDATED WITH AK4395 INPUT									
CO E									
	AK4395								
PERFORMANCE DATA CONSOLIDATED WITH AK4395 INPUT									
91 ORD DET									
	AK4556	766	316	12	175	177	45	16	
			41.2 X	1.5 X			25.4 X	35.8 X	
708 MM BN TOTAL									
		6907	1349		1363	20770	14949	10649	
			22.1 X				73.0 X	71.3 X	
8TH INF DV TOTALS									
					1363	22784	686	11456	133
							71.8 X	72.1 X	

PAGE 08

FIFTH CORPS  
ATH 14F DV

[illegible]

ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-322-(R1))

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UNIT IDENTIFICATION STOCKAGE LIST LINES NSL ACTION ON REQUESTS RECEIVED AT DSU'S

DESIGNATION DOD AAC TOTAL NUMBER AT ZERO BALANCE CN DSU ASL (X OF ASL) (X OF ASL) (X OF ASL) NUMBER WITH EXCESS ON HAND (X OF ASL) NUMBER OF REQUESTS RECEIVED (AND X) DEMAND REQUESTED (AND X) DEMAND ACCOMMODATION (AND X) SATISFACTION ESTIMATED (AND X) BACK ORDER

FIFTH CORPS V COSCOM

296 MNT CO AK4267 387 64 17.0 X 13 3.0 X 25 1457 90 2.7 X 1024 878 462  
19 MNT CO AK4342 2304 920 21.8 X 270 11.3 X 143 753 6 7 X 590 41 6.9 X  
881 LEM CO AK4285

PERFORMANCE DATA CONSOLIDATED WITH AK4302 INPUT

71 ORD CO AK4269 506 94 16.7 X 73 12.2 X 206 198 81 40.9 X 38 46.9 X  
8 MAINT BN TOTALS 3337 678 20.3 X 374 2408 46 1.9 X 2095 957 462

508 MNT CO AK4340 2780 420 15.2 X 350 12.7 X 78 3294 70 1931 1099 784  
14 MNT CO AK4506 1600 424 25.0 X 116 6.8 X 2078 727 1068 616 309  
18 MNT CO AK4320 2106 877 20.3 X 480 21.9 X 121 2076 196 924 439 173  
24 S&S CO AK4345 1760 378 21.1 X 304 17.2 X 368 2450 125 1080 1272 97  
19 MNT BN TOTALS 8386 1793 21.3 X 865 11728 1118 5595 3420 1443

**FIFTH CORPS**      **V COSCOM**

**A-10**

UNIT IDENTIFICATION													STOCKAGE LIST LINES													ACTION ON REQUESTS RECEIVED AT 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ROSA FEBRUARY

ACTION ON CURRENT MONTH REQUISITIONS SUBMITTED TO USANMAE  
(BASED ON DATA ON CURRENT MONTH REQUISITIONS CO-PILED FROM THE USANMAE DCF)

PAGE 12

UNIT IDENTIFICATION: REQUISITIONS SUBMITTED TO USANMAE  
REQUISITIONS REJECTED: MATERIAL RELEASE ORDERS  
DESIGNATION DOD TOTAL NUMBER NUMBER CODE CODE CODE CODE TOTAL  
AAC PRIORITY PROJECT CA CB CJ CO ZO DOLLAR BACK VALUE ORDERS  
01-03 04-08 01-04-08 01-03 04-08

FIFTH CORPS V COSCOM

099 MNT CO	AK4280	1040	114	186	30	91	8	34	7	2	1145	2133918	16	716	30	30
26585(POL)	AK4705	82	25	30.42	30.42	5					61	1174	3	23		18
931 MNT CO	AK4272	802	90	92	162	23	2	7			691	533218	8	283	16	18
957 MNT CO	AK4041	990	98	132	227	85	4	45	1	2	638	1012360	1	288	11	19
26 545 CO	AK4274	1319	38	296	291	64	13	10	5	12	446	92886	81	748	6	94
50 TC CO	AK4281	983	171	218	389	35	9	8	1	18	578	180314	23	378	74	81
99 MNT BN	TOTALS	6116	503	909	1414	268	36	101	14	34	3360	3945912	102	2448	140	193

V COSCOM TOTALS 14391 1561 2011 3572 793 104 316 35 48 29 8314 15414840 188 5817 388 381



NOVA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-4EAGD-322-(R1))

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UNIT IDENTIFICATION..... STOCKAGE LIST LINES..... ACTION ON REQUESTS RECEIVED AT DSU'S
.....
DESIGNATION DDD..... TOTAL..... NUMBER AT..... NUMBER WITH..... NUMBER OF..... DEMAND..... DEMAND..... ORDER
AAC..... ON..... ZERO BALANCE..... HAND..... OF LINES..... REQUESTS..... REQUESTS..... REQUESTS.....
..... DSU ASL (X OF ASL)..... (X OF ASL)..... ON HAND..... (AND X)..... (AND X)..... (AND X)

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SEVENTH CORPS 1ST ID PWD

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CO E AKAT03 2284 943 56 100 3851 2016 1425 500
41.2 X 2.4 X .2 X 70.7 X

701 MNT BN TOTALS 2284 943 100 3851 2016 1425 500
41.2 X .2 X 70.7 X

1ST ID PWD TOTALS 100 3851 2016 1425 500
.2 X 70.7 X

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PAGE 10

SEVENTH CORPS 54803 MINZAS

[illegible]

MOSE FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-322-(R1))

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UNIT IDENTIFICATION: STOCKAGE LIST LINES \* NSL \* ACTION ON REQUESTS RECEIVED AT DSU'S

DESIGNATION DOD \* TOTAL NUMBER AT EXCESS WITH \* NUMBER \* REQUESTS \* DEMAND \* BACK  
AAC \* ON ZERO BALANCE HAND \* OF LINES \* RECEIVED \* ACCOMMODATION SATISFACTION ORDER  
\* DSU ASL \* (% OF ASL) \* (% OF ASL) \* ON HAND \* (AND X) \* (AND X) \* (AND X)

SEVENTH CORPS 3RD INF DIV

3 SGT BN AK0916 425 50 31 50 2155 421 955 756 199  
13.0 X 7.2 X 19.8 X 55.0 X 79.1 X

HQ CO A AK0912 4661 1124 374 192 22533 4184 14125 10396  
24.2 X 8.0 X 18.4 X 76.8 X 73.6 X

CO B ACPT AK0908 504 93 48 513 41 243 174  
18.0 X 8.0 X 7.9 X 81.4 X 71.6 X

218 ORD BT AK0901 870 86 12 27 205 26 35  
6.6 X 1.3 X 14.1 X 52.8 X 69.8 X

708 MNT BN TOTALS 9105 1873 179 23251 4224 1405 10635  
20.8 X 18.8 X 10.2 X 76.0 X 73.8 X

3RD INF DIV TOTALS 232 29406 4855 15416 11391 199  
18.3 X 74.2 X 73.8 X

SEVENTH CORPS  
3RD INF DIV

[illegible]

**SECOND SUPCOM CORPS 2D SUPCOM**

[illegible]

**SECOND SUPCOM CORPS 2D SUPCOM**

[illegible]

ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-322-(R1))

PAGE 21

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**SECOND SUPCOM CORPS 2D SUPCOM**

78 MNT CD	AK4827	291	23 9.1%	61 24.3%	84 33.6%	23 9.1%	61 24.3%	84 33.6%	180	116614	7	102	6	10
124 MNT CD	AK4821	473	97 20.5%	146 30.8%	243 51.3%	31 6.5%	2	2	302	11301	6	93	13	17
903 MNT CD	AK4826	3	1 33.3%	2 66.6%	3 99.9%	1 233.3%			1					
87 MNT BN TOTALS		727	121 16.6%	209 28.7%	330 45.3%	32 4.4%	2	2	543	110916	13	104	19	38
42 MNT CD	AK4738	1160	188 15.8%	591 47.5%	736 63.6%	24 2.0%	1	1	886	120228	21	321	50	70
66 MNT CD	AK4907	773	215 27.8%	273 35.3%	482 63.1%	32 4.1%	2	14	692	506418	20	192	24	56
102 MNT CD	AK4720	421	171 40.6%	42 9.9%	213 50.5%	26 6.1%	9	1	239	210210	34	114	36	14
116 ORD D1	AK4724	57	47 82.4%	3 5.2%	50 87.6%	17 29.8%	1	1	29	308	3	10	8	
903 S45 CD	AK4904	1283	13 1.0%	66 5.1%	79 6.1%	8 .6%	2	4	518	694350	14	810	1	27
903 MNT BN TOTALS		3694	631 17.0%	935 25.3%	1566 42.3%	107 2.9%	12	16	2100	1540815	2	1447	128	164



ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-322-(R1))

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UNIT IDENTIFICATIONS STOCKAGE LIST LINES NSL ACTION ON REQUESTS RECEIVED AT DSU'S

DESIGNATION DOD AAC TOTAL NUMBER AT ZERO BALANCE (X OF ASL) DSU ASL (X OF ASL) NUMBER WITH EXCESS ON HAND (X OF ASL) NUMBER OF REQUESTS RECEIVED (X OF LINES) OF HAND (X OF ASL) DEMAND ACCOMMODATION (AND X) DEMAND SATISFACTION (AND X) BACK ORDER ESTMO

## SECOND SUPCON CORPS 20 SUPCON

8908 CL CO AK4820	1769	228	12.8 X	105	8.1 X	6297	121	4498	3779	916
8904 CL CO AK6714	2406	284	11.8 X	52	2.1 X	6851	211	5314	3263	824
8905 CL CO AK4820	824	58	6.3 X	48	5.8 X	3436	20	1924	1889	21
8930 CL6 TOTALS	4999	564	11.2 X	95		18584	352	11736	9937	1305

2 SUP C111 AK6737	114	1	.8 X	15	12.2 X	2713	121	2713	2706	3
29 TC C111 AK4820	2083	379	19.2 X	250	12.1 X	606	12	379	283	44
07 1.29 TC AK4820	3598	428	12.9 X			1951	52	900	606	236
2 SUP C111 TOTALS	5465	804	16.7 X	75		5270	64	3892	3995	285

20 SUPCON TOTALS	3161	59271	3660	6.1 X	3660	26861	7941	73.4 X		
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**SECOND SUBCOM CORPS 2D SUBCOM**

[illegible]

56TH FA BDE 56 FA BDE

DEATH REPORT RECEIVED

442	342
308	77.3

ACTION ON CURRENT MONTH REQUISITIONS SUBMITTED TO USAMMAE  
(BASED ON DATA ON CURRENT MONTH REQUISITIONS COMPILED FROM THE USAMMAE DCF)

[illegible]

06TH PA 008 06 PA 008

10N 01 ART	AK4554	324	30	07	175	12	1	7	1	2023	1020001	123	10	20
			11.72	20.02	30.52	3.72								
02N 01 ART	AK4018	041	00	52	92	17		3	2	234	091323	1	102	10
			9.02	11.72	20.72	3.02								10
30N 04 ART	AK4003	204	110	30	157	53		03	2	101	100	3	00	20
			41.02	13.72	35.22	10.02	1							10

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2
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UNIT IDENTIFICATION
STOCKAGE LIST LINES
UNIT NO. 0 1 2 3 4 5 6 7 8 9
DESIGNATION DDD 0 TOTAL NUMBER AT 0 NUMBER 0 REQUESTS 0 DEMAND 0 DEMAND 0
AAC 0 ON ZERO BALANCE HAND 0 OF LINES 0 RECEIVED 0 (AND X) 0 (AND X) 0
0 DSU 3SL (X OF ASL) 0 (X OF ASL) 0 ON HAND 0 (AND X) 0 (AND X) 0
38D AADCOM 38D AADCOM
3ML BN 7A AK0100 1037 104 53 100 1334 1213 1136 41
8.0 X 2.0 X 100 91.0 X 93.0 X
3ML BN 60A AK0181 2007 154 112 41 1349 1394 1070 100
7.3 X 5.3 X 41 86.5 X 82.0 X
3ML BN 1A AK0380 1089 226 73 270 1726 985 765 100
23.9 X 7.0 X 270 3.1 X 80.1 X
2ML BN 2A AK0390 2185 182 5 100 917 642 480 84
6.0 X .2 X 100 71.3 X 71.4 X
2ML BN 57A AK0023 2069 131 139 200 2086 1721 1504 164
6.3 X 6.7 X 200 65.4 X 67.3 X
27
3ML BN 60A AK0204 1202 350 111 107 433 308 183
27.3 X 0.6 X 107 49.5 X 50.1 X
11AD 96 BN AK0433 NO REPORT RECEIVED
TOTALS 10489 1117 890 8048 6140 5006 544
10.6 X 2.2 X 71.0 X 92.8 X

```

**800-678-1510**

55

ROSA FEBRUARY

DIRECT SUPPORT UNIT SUPPLY PERFORMANCE  
(BASED ON INPUT CARDS SUPPLIED BY DSU/GSU UNITS)

(RCS-AEAGD-382-(R1))

PAGE 29

UNIT IDENTIFICATION	STOCKAGE LIST LINES	NSL	ACTION ON REQUESTS RECEIVED AT DSU'S	DESIGNATION	DDO	TOTAL ON DSU ASL	NUMBER AT ZERO BALANCE (% OF ASL)	EXCESS ON HAND (% OF ASL)	NUMBER WITH HAND ON ASL	NUMBER OF REQUESTS REJECTED (AND X)	DEMAND ACCOMMODATION (AND X)	DEMAND SATISFACTION (AND X)	BACK ORDER ESTMO
2ML BN 62A AK6711	3095	203	6.5 X	15	3219	485	15	3.0 X	204	62.5 X	105	56.1 X	194
6ML BN 52A AK6900	3331	308	9.2 X	65	103	1278	20	1.8 X	1028	81.7 X	713	80.8 X	80
2ML BN 6A AK6389	2105	140	6.6 X	108	8	2214	61	2.7 X	1722	79.0 X	1521	88.3 X	102
3ML BN 71A AK6462	1810	327	19.0 X	193	632	110	17.4 X	483	62.5 X	385	79.7 X	90	90
2ML BN 1A AK6504	1590	82	5.2 X	62	271	302	60	11.0 X	303	66.8 X	284	93.7 X	9
2ML BN 56A AK6782	1922	236	12.2 X	18	680	1148	32	2.7 X	986	96.6 X	786	82.2 X	63
224 ORD DT AK6201	10780	2370	22.0 X	1040	120	1850	70	3.7 X	600	52.4 X	55	13.74	1480
92 ORD DT AK6202	1349	388	26.0 X	231	283	283	8	3.1 X	213	86.5 X	169	79.3 X	12
172 ORD CO AK6204	1369	222	16.2 X	30	30	299	22	7.3 X	201	72.5 X	201	100.0 X	34
TOTALS	27301	4240	15.5 X	4562	8661	398	4.8 X	5400	67.7 X	6974	88.8 X	3002	3002
320 AADCON TOTALS				5352	17506	596	3.4 X	11740	69.4 X	15050	85.8 X	2560	2560

ACTION ON CURRENT MONTH REQUISITIONS SUBMITTED TO USAMMAE  
BASED ON DATA ON CURRENT MONTH REQUISITIONS COPIED FROM THE USAMMAE DCF)

[illegible]

320 AADCOM 320 AADCOM

Model	Year	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	24
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	6106	615	2017	2632	219	11	66	20	10	12	4114	1116186	109	1779	141	459
ANDCOM TOTALS	6106	615	2017	2632	219	11	66	20	10	12	4114	1116186	109	1779	141	459



**APPENDIX B**

**SYSTEMS CHANGE REQUEST  
VARIABLE ORDER AND SHIPPING TIME**

APPENDIX B  
SYSTEMS CHANGE REQUEST  
VARIABLE ORDER AND SHIPPING TIME

ATSM-CTD-CS

10 May 1974

SUBJECT: Systems Change Request (SCR)

HQDA (DALO-PLS)  
Washington, D. C. 20310

1. Request the attached SCR (Inclosure 1), which has been prepared in accordance with Chapter 7, AR 18-1, be reviewed for approval and implementation.
2. Subject SCR is being forwarded direct to the HQDA proponent agency as prescribed by AR 18-1, para 7-51.
3. The proposed SCR is applicable to both NCR 500 and DLOGS - Class IX systems.
4. Action officer for this project is CPT Walter A. Bawell, Autovon 687-1046/1047.

FOR THE COMMANDANT:

1 Incl  
as

JAMES P. MAY, JR.  
Captain, QMC  
Assistant Secretary

CF:  
HQDA (DALO-SUP)  
CDR, USALOGC, ATTN: ATCL-S

## SYSTEMS CHANGE REQUEST

1. TO: HQDA, DALO-PLS, WASH DC 20310
2. FROM: Commandant  
US Army Quartermaster School  
ATTN: ATSM-CTD-CS  
Fort Lee, Virginia 23801
3. ORIGINATOR NUMBER: No number has been assigned. Appendix P, AR 18-1, C2, dated 9 November 1973 does not list an identification code for DLOGS (Class IX) or DSU/GSU (NCR 500) systems.
4. ARA NO: N/A
5. CATEGORY: A-2
6. a. ORGANIZATIONAL LEVEL: No level code listed in Appendix P, AR 18-1.  
b. OPERATING ENVIRONMENT: Project environment code not listed in Appendix P, AR 18-1.
7. INCIDENT ENCOUNTERED: N/A
8. POINT OF CONTACT: CPT Walter A. Bawell, 687-1046/1047.
9. TYPE OF CHANGE: A-2, functional environment.
10. PROGRAM ID AND VERSION NUMBER: All programs within the NCR 500 and DLOGS (Class IX) systems that compute requisitioning objectives and reorder points.
11. SHORT TITLE: Implementation of Variable Order-Ship Time (VOST) data in the computation and reorder points.
12. DOCUMENTATION/IDENTIFICATION: N/A
13. ATTACHMENTS: None
14. NARRATIVE:
  - a. PROBLEM DESCRIPTION: Both nondivisional and divisional automated DSU systems (NCR 500 and DLOGS - Class IX) use a fixed order-ship time expressed in days of supply, the millstone of the DSU supply system. Whenever actual order-ship time exceeds the programmed fixed order-ship time, the safety level is penetrated and zero balances often occur. The actual order-ship time influences virtually every measure of DSU performance. Therefore, it is absolutely essential that a variable order-ship time (VOST) capability be included in the NCR 500 and DLOGS automated systems.

Incl 1

b. RECOMMENDED SOLUTION: For NCR 500 equipped DSUs, especially with the planned addition of an expanded 400 word core memory, implementation of a VOST capability would come at an opportune time. The data on actual order-ship time can be compiled as follows:

(1) Subtract the requisition date that appears on the due-in card (receipt card), card columns 36-39, from the processing date that appears on the parameter card (Constant Data Lead Card).

(2) Compile actual order-ship time upon the median of the most recent five stock replenishment actions. The median is recommended in lieu of the mean since the median is not subject to extreme delays of unusually rapid replenishments.

15. COPIES FURNISHED:

HQDA (DALO-SUP)  
CDR, USALOGC, ATTN: ATCL-S  
Enlisted Sup Department, ATSM-TEX-ES  
Logistics Career Department, ATSM-TEX-LC

APPENDIX C

TEST OF SIGNIFICANCE OF THE DIFFERENCE  
BETWEEN TWO SAMPLE MEANS (DIVISION  
RECEIPT PROCEDURES)

## APPENDIX C

TEST OF SIGNIFICANCE OF THE DIFFERENCE  
BETWEEN TWO SAMPLE MEANS (DIVISION  
RECEIPT PROCEDURES)

1. The purpose of this test is to test the significance of the difference between the mean time from the document date to the receipt date for all receipts with a shipment status and the mean time from the document date to the sample date for requisitions with a shipment status 25 days old, or older, which had not been shown as received on division records. Normality is assumed.

2. Statistics for all receipts:

a.  $\bar{X}_1 = 18.189$  days

b.  $S_1^2 = 413.679$

c.  $S_1 = 20.339$  days

d.  $n_1 = 617$

3. Statistics for requisitions with shipment status 25 days old or older:

a.  $\bar{X}_2 = 135.38$  days

b.  $S_2^2 = 1770.402$

c.  $S_2 = 42.076$  days

d.  $n_2 = 187$

4. Null Hypothesis:  $\mu_1 = \mu_2$

5. Level of Significance:  $\alpha = .01$

6.  $\bar{X}_2 - \bar{X}_1$

$$a. \hat{S}_d^2 = \frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2}$$

$$b. \hat{S}_d^2 = \frac{(617)(413.679) + (187)(1770.402)}{617 + 187}$$

$$c. \hat{S}_d^2 = 729.235$$

d.  $\hat{S} + 27.004$

7.  $S = \frac{135.88 - 18.189}{27.004} = 4.339$

8. Conclusion

a.  $S_c(\text{computed}) = 4.339$

b.  $S_t(\text{tabular}) = 2.58$

c. Since  $S_c > S_t$ , the null hypothesis is rejected. We can say with 99% assurance that the two distributions did not come from the same population.

**APPENDIX D**

**PLL CLERK QUESTIONNAIRES  
AND ANALYSIS**



APPENDIX D  
PLL CLERK QUESTIONNAIRES  
AND ANALYSIS

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<u>SUBJECT</u>	<u>PAGE</u>
1. PLL Clerk Questionnaire	D-2
2. Questionnaire Answers	D-8
3. Ranking of Correct Responses	D-12
4. Comparison of Incorrect Responses by Division	D-13
5. Test of Sample Mean Compared to an Assumed Mean Response of 70% Correct	D-14
6. Comparison of Percentage Correct and Incorrect to Percentage School Trained and Average Months on the Job	D-15
7. Comparison of Percent Correct to Percent School Trained in PMOS, and Number Correct to Average Months on the Job	D-16

READ THIS PAGE BEFORE ANSWERING THE ENCLOSED QUESTIONS

INSTRUCTIONS

1. General.

Answer each question completely and to the best of your ability. Use a ball point or ink pen and write legibly. If you have any questions about the intent or the meaning of a question, raise your hand and ask the monitor. No time limit has been established for this open-book questionnaire.

2. Purpose.

The purpose of this questionnaire is to obtain data which will be used in conjunction with a Repair Parts Study. The Study is being conducted in an effort to improve the Army Repair Parts System.

QUESTIONNAIRE

1. (a) Define the term Prescribed Load List (PLL).
- (b) Describe the three methods used to develop a PLL.

ANSWER:

(a) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. How is an initial PLL established? What information is needed?

ANSWER: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. What actions can be taken up to the fourth review to revise and update PLL?

ANSWER: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

First Review - \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Second Review - \_\_\_\_\_

Third Review - \_\_\_\_\_

Fourth & Subsequent Review - \_\_\_\_\_

4. When can non-PLL (non-stock items) be added to the PLL and when will non-stock record cards be destroyed?

ANSWER: \_\_\_\_\_

5. When is a high priority requisition authorized to fill a requirement for an item on the PLL?

ANSWER: \_\_\_\_\_

6. Who is the approving authority for a unit's PLL and for changes?

ANSWER: \_\_\_\_\_

7. How often will non-stock list item demand files be reviewed?

ANSWER: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. What is the minimum number of demands within the 180-day period to qualify for stockage?

ANSWER: \_\_\_\_\_

9. Who determines the number of prescribed loads a unit is authorized?

ANSWER: \_\_\_\_\_  
\_\_\_\_\_

10. What do the following stockage codes mean?

- a. MS ANSWER: \_\_\_\_\_  
\_\_\_\_\_
- b. DS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- c. HD \_\_\_\_\_  
\_\_\_\_\_

11. What is the primary purpose of maintaining an accurate document register DA Form 2064?

ANSWER: \_\_\_\_\_  
\_\_\_\_\_

12. Certain designated supplies are authorized to be issued in a manner to simplify and speed up delivery of replacement repair parts. The need for a Request for Issue or Turn-In is eliminated

and permits organizational representatives to hand-carry un-serviceable parts directly to the Supply Support Activity and receive a serviceable item. This procedure or system is called \_\_\_\_\_

13. When should a PLL (DA Form 2063R) be revised?

ANSWER: \_\_\_\_\_

14. TRUE OR FALSE: (Use blank space for your answers)

a. When initially preparing the PLL for a newly activated unit the items listed should be repair parts and associated maintenance supplies based on the historical consumption data of similar unit or other sources available. \_\_\_\_\_

b. In preparing the PLL for approval, all items are consolidated into a single PLL. \_\_\_\_\_

c. You are posting nonstockage item demands on DA Form 3318 (Record of Demands - Title Insert). If the posting you make is the third demand within the last 180-day period, the next action you take is to compute stockage quantity and add the item to the PLL. \_\_\_\_\_

d. On 12 Dec 74, you inspected the special purpose load. You should perform the next inspection on 12 Mar 75. \_\_\_\_\_

15. In the space provided below, state in brief the additional duties you are required to perform in your present assignment. If you are not required to accomplish duties described in this questionnaire, explain how yours differ.

\_\_\_\_\_

\_\_\_\_\_

PERSONNEL INFORMATION

What is your present primary MOS? \_\_\_\_\_

What is the MOS of present assignment? \_\_\_\_\_

Are you school trained in your primary MOS? \_\_\_\_\_

If trained at QM School, was information provided adequate to  
accomplish duties required? \_\_\_\_\_

Are you school trained in present assignment if different from  
primary MOS? \_\_\_\_\_

Was information provided adequate? \_\_\_\_\_

If not school trained, how did you receive training in present  
or primary MOS? \_\_\_\_\_

Date assigned to present position? \_\_\_\_\_

Any comments you would care to make that might improve PLL  
clerks training. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### PLL CLERK QUESTIONNAIRE

1. Define the term Prescribed Load List (PLL).

ANSWER: A list of repair parts and maintenance related items which are required to be on hand or on request to sustain the unit's organic maintenance program.

2. Describe the three methods used to develop a PLL.

ANSWER: Historical demand data of similar units maintaining the same equipment, modified by local mission requirements, and/or information furnished by US Army Materiel Command, Logistic Data Center.

3. How is an initial PLL established? What information is needed?

ANSWER: Determine what repair parts are applicable to the equipment in the organization by referring to DA Pamphlet 310-4 and compute types and quantities of repair parts to be stocked using methods described above.

4. What actions can be taken up to the fourth review to revise and update PLL?

ANSWER: Record of demand cards will be reviewed every 90 days or each calendar quarter to determine whether changes are needed.

5. First Review.

ANSWER: PLL item stockage quantity cannot be increased, decreased, or deleted.

6. Second Review.

ANSWER: Stock quantity can be increased based upon demands except High Dollar (HD); cannot be decreased or deleted.



7. Third Review.

ANSWER: Stockage quantity can be increased based upon demands, except HD; can be decreased, but not below initial stockage quantity; cannot be deleted.

8. Fourth and Subsequent Review.

ANSWER: Stockage quantity can be increased based upon demands, except HD; can be decreased based upon demands, can be deleted if minimum storage (MS) less than 3 demands during the last two review periods and HD if special authorization is received.

9. When can non-PLL (non-stock items) be added to the PLL and when will non-stock record cards be destroyed?

ANSWER: If three separate demands are recorded within 180 days or less. Non-stock cards will be destroyed if item has not received one demand during the last two calendar quarters or 180 days.

10. When is a high priority requisition authorized to fill a requirement for an item on the PLL?

ANSWER: When a Not Operational Ready for Supply (NORS) or anticipated NORS condition exists, and a force activity designator I, II, or III is possessed by the requesting unit.

11. Who is the approving authority for a unit's PLL and for changes?

ANSWER: The commander maintaining the applicable PLL.

12. How often will non-stock list item demand files be reviewed?

ANSWER: Will be reviewed every 90 days or each time a posting is made to determine those items which have accrued three demands

within the most recent 180-day period.

13. What is the minimum number of demands within the 180-day period to qualify for stockage?

ANSWER: Three demands within the most recent 180-day period.

14. Who determines the number of prescribed loads a unit is authorized?

ANSWER: Major commands may authorize or direct organizations to maintain more than one PLL.

What do the following stockage codes mean:

15. MS      ANS: "Minimum Stockage" and indicates a part originally qualified for PLL stockage.

16. DS      ANS: "Demand Supported" and indicates a part that was once "non-stock" and later qualified for PLL stockage.

17. HD      ANS: "High Dollar" and indicates a high-dollar value item or a part that has a recoverability code of "T" in the Army Master Data File.

18. What is the primary purpose of maintaining an accurate document register DA Form 2064?

ANSWER: Provides a record of supply actions taken in supporting unit equipment and is essential to efficient repair parts management.

19. Certain designated supplies are authorized to be issued in a manner to simplify and speed up delivery or replacement repair parts. The need for a Request for Issue or Turn-In is eliminated

and permits organizational representatives to hand-carry un-serviceable parts directly to the Supply Support Activity and receive a serviceable item. This procedure or system is called \_\_\_\_\_.

ANSWER: Direct Exchange.

20. When should a PLL (DA Form 2063R) be revised?

ANSWER: Whenever the models or densities of equipment change or as required by a change to applicable technical manuals.

TRUE OR FALSE: (Use blank spaces for your answers)

21. When initially preparing the PLL for a newly activated unit the items listed should be repair parts and associated maintenance supplies based on the historical consumption data of similar unit or other sources available. TRUE.

22. In preparing the PLL for approval, all items are consolidated into a single PLL. TRUE.

23. You are posting nonstockage item demands on DA Form 3318 (Record of Demands - Title Insert). If the posting you make is the third demand within the last 180-day period, the next action you take is to compute stockage quantity and add the item to the PLL. TRUE.

24. On 12 Dec 74, you inspected the special purpose load. You should perform the next inspection on 12 Mar 75. TRUE.

Sequence	Question	No. Correct	% of 128
1	13	111	86.7
2	19	111	86.7
3	11	109	85.2
4	21	108	84.4
5	18	107	83.6
6	1	106	82.8
7	23	104	81.1
8	22	100	78.1
9	16	97	75.8
10	12	96	75.0
11	2	95	74.2
12	9	93	72.7
13	17	91	71.1
14	3	90	70.3
15	15	85	66.4
16	24	82	64.0
17	20	71	55.5
18	10	65	50.7
19	4	60	46.8
20	5	54	42.2
21	8	54	42.2
22	6	46	35.9
23	14	45	35.2
24	7	43	33.6

Figure D-1. Ranking of correct responses.

Question No.	Division A (41)	Division B (24)	Division C (17)	Division D (46)
1	1	2	6	12
2	10	3	7	12
3	9	4	7	18
4	15	8	11	34
5	19	11	14	29
6	22	14	14	32
7	22	14	15	34
8	16	12	14	32
9	9	5	6	15
10	30	17	4	11
11	8	4	2	3
12	1	3	7	21
13	3	1	5	8
14	29	18	14	22
15	8	12	6	17
16	5	6	3	17
17	4	9	6	18
18	5	6	2	18
19	6	2	2	7
20	16	11	7	23
21	10	13	0	7
22	10	3	3	11
23	3	2	5	13
24	12	8	6	18

Figure D-2. Comparison of incorrect responses by division.

Test of Sample Mean Compared  
to an Assumed Mean Response  
of 70% Correct

1. At a 95% level of confidence, determine if the sample of 128 responses is representative of an unknown population. Mean of sample is 65.8 with a standard deviation of 5.27.

Hypothesis is that the population would score an average of 70% on the questionnaire.

$$H_1: \mu = 70$$

$$H_2: \mu \neq 70$$

$$Z_{\alpha.05} = \pm 1.96$$

$$Z = \frac{\bar{X} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{65.8 - 70}{\frac{5.27}{\sqrt{128}}} = -0.7969$$

2. Evaluation of divisional responses using same criteria.

<u>Div</u>	<u>std dev</u>	<u>Avg % Correct</u>	<u>Z</u>
A	4.26	71.83	+0.4296
B	4.44	68.92	-0.2432
C	5.49	59.33	-1.9435
D	5.96	61.33	-1.4547

3. All of the above values for Z are within the  $\pm 1.96$  acceptance region.

4. Detailed calculations are not shown for an assumed average of 75%. The overall sample and the samples of divisions A and B would be within the acceptance range but the samples from divisions C and D would not be within the acceptance region.

Category	Div A	Div B	Div C	Div D
Total Responses	41	24	17	46
% Correct	72	69	59	61
% Incorrect	28	31	41	39
% School Trained in PMOS	51.2	70.8	52.9	77.5
% School Trained in AMOS	29.0	50.0	52.9	37.5
Average MOS in Assignment	15.4	5.9	7.3	9.3

Figure D-3. Comparison of percentage correct and incorrect to percentage school trained and average months on the job.

Comparison of Percent Correct to  
Percent School Trained in PMOS,  
Months on the Job

1. Comparison of Percent Correct to Percent School Trained in PMOS.

a. Percent Correct

<u>Div</u>	<u>X</u>	<u>(X - <math>\bar{X}</math>)</u>	<u>(X - <math>\bar{X}</math>)<sup>2</sup></u>
A	72	6.75	45.56
B	69	3.75	14.06
C	59	-6.25	39.06
D	61	-4.25	18.06
	<u>261</u>		<u>116.74</u> = $s^2_C$

$$\bar{x}_C = 65.25$$

b. Percent School Trained in PMOS.

<u>Div</u>	<u>X</u>	<u>(X - <math>\bar{X}</math>)</u>	<u>(X - <math>\bar{X}</math>)<sup>2</sup></u>
A	51.2	-11.9	141.61
B	70.8	7.7	59.29
C	52.9	-10.2	104.04
D	77.5	14.4	207.36
	<u>252.4</u>		<u>512.3</u> = $s^2_{ST}$

$$\bar{x}_{ST} = 63.1$$

$$c. \left( \bar{x}_C - \bar{x}_{ST} \right)^2 = \left( \frac{n_C s_C^2 + n_{ST} s_{ST}^2}{n_C + n_{ST} - 2} \right) \left( \frac{n_C + n_{ST}}{n_C (n_{ST})} \right)$$

$$= \left( \frac{4(116.74) + 4(512.3)}{4 + 4 - 2} \right) \left( \frac{4 + 4}{4(4)} \right)$$

$$\bar{x}_C - \bar{x}_{ST} = 14.48$$



$$d. \quad t = \frac{\bar{x}_c - \bar{x}_{st}}{\frac{\sigma \bar{x}_c - \bar{x}_{st}}{14.48}} = \frac{65.25 - 63.1}{14.48} = .1484$$

e.  $t_{\alpha .05} = \pm 2.447$   $t = .1484$  Therefore Accept

f. With a level of confidence of 95% there is an acceptance of the hypothesis that a direct relationship exists between the percent of correct responses to this test and the percentage of respondents who are school-trained in their primary MOS.

## 2. Comparison of Number Correct to Average Months on the Job.

### a. Average Number Correct

Div	% Correct	No. of Correct of 24 <u>X</u>	<u>(X - <math>\bar{X}</math>)</u>	<u>(X - <math>\bar{X}</math>)<sup>2</sup></u>
A	72	17.28	1.62	2.62
B	69	16.64	.9	.81
C	59	14.16	-1.5	2.25
D	61	14.64	-1.02	1.04
		<u>62.64</u>		<u>6.72</u> = $s^2_C$

$$\bar{x}_c = 15.66$$

### b. Average Months on the Job

Div	X	(X - $\bar{X}$ )	(X - $\bar{X}$ ) <sup>2</sup>
A	15.4	5.925	35.105
B	5.9	-.175	.031
C	7.3	-3.575	12.781
D	9.3	-2.175	4.731
	<u>37.9</u>		<u>52.647</u> = $s^2_J$

$$\bar{x}_s = 9.475$$

$$c. \quad \left( \frac{\sigma \bar{x}_c - \bar{x}_j}{\frac{4 + 4 - 2}{4}} \right)^2 = \frac{4(6.72) + 4(52.65)}{4 + 4 - 2} + \frac{4 + 4}{4(4)}$$

$$\sigma \bar{x}_c - \bar{x}_j = 4.448$$

d.  $t = \frac{(15.66 - 9.475)}{4.448} = 1.39$

e.  $t^{\alpha} .05 = \pm 2.447$        $t = 1.39$       Therefore Accept

f. With a level of confidence of 95% there is an acceptance of the hypothesis that a direct relationship exists between the number of correct responses to this test and the average number of months on the job.

APPENDIX E

COMPLETED DIVISION REQUISITIONS  
SUBMITTED TO ARMCOM, AVSCOM,  
AND TACOM

## APPENDIX E

### COMPLETED DIVISION REQUISITIONS SUBMITTED TO ARCOM, AVSCOM, AND TACOM

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1. The figures included in this appendix provide additional detail for the completed requisitions in the repair parts sample and provide the basis for the summary data used in Chapter 2 of the report.
2. The following abbreviations are used in the figures:
  - a. BF - No record status
  - b. AS1 - Shipment status

CATEGORY	n	DOCUMENT DATE TO ASL STATUS (Mean Days)	ASL TO RECEIPT (Mean Days)	ORDER SHIP TIME * (Mean Days)
ASL	28	17.6	14.8	32.6
NSL	45	32.6	11.3	43.2
AVERAGE ASL/NSL	---	27.5	12.6	39.1

Figure E-1. Completed division requisitions submitted to ARCOM.

\*Includes both requisitions with ASL and BF status.

CATEGORY	PERCENT WITH BF STATUS	ORDER SHIP TIME BF STATUS (Mean Days)	ORDER SHIP TIME ASL STATUS (Mean Days)
ASL	54.1	32.8	32.4
NSL	31.8	39.3	44.9
AVERAGE ASL/NSL	45.4	35.3	40.1

Figure E-2. Completed division requisitions submitted to ARMCOM, analysis of ASL and BF status.

CATEGORY	n	DOCUMENT DATE TO REC AT AVSCOM (MEAN DAYS)	AVSCOM REC DATE TO AS1 STATUS (MEAN DAYS)	AS1 TO RECEIPT (MEAN DAYS)	PERCENT WITH BF STATUS
ASL	620	3.8	12.1	17.7	33.7
NSL	606	4.0	24.6	18.2	29.4
AVERAGE ASL/NSL	---	3.9	17.9	17.9	31.7

Figure E-3. Completed division requisitions submitted to AVSCOM.

CATEGORY	PERCENT WITH BF STATUS	ORDER SHIP TIME BF STATUS (Mean Days)	ORDER SHIP TIME ASL STATUS (Mean Days)
ASL	33.7	21.9	33.6
NSL	29.4	39.9	46.8
AVERAGE ASL/NSL	31.7	29.3	39.7

Figure E-4. Completed division requisitions submitted to AVSCOM, analysis of ASL and BF status.



CATEGORY	n	DOCUMENT DATE TO AS1 STATUS (Mean Days)	AS1 TO DSU RECEIPT (Mean Days)	ORDER SHIP TIME (Mean Days) *
ASL	98	31.0	23.8	46.4
NSL	188	64.4	21.7	69.1
AVERAGE ASL/NSL	---	52.9	22.3	61.3

Figure E-5. Completed division requisitions submitted to TACOM.

\*Includes both requisitions with AS1 and BF status.

CATEGORY	PERCENT WITH BF STATUS	ORDER SHIP TIME BF STATUS (Mean Days)	ORDER SHIP TIME ASL STATUS (Mean Days)
ASL	41.0	43.6	54.8
NSL	35.0	42.5	86.1
AVERAGE ASL/NSL	37.0	43.0	75.2

Figure E-6. Completed division requisitions submitted to TACOM, analysis of ASL and BF status.

APPENDIX F

OPEN DIVISION REQUISITIONS  
SUBMITTED TO ARMCOM, AVSCOM  
AND TACOM

## APPENDIX F

### OPEN DIVISION REQUISITIONS SUBMITTED TO ARMCOM, AVSCOM, AND TACOM

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1. The figures included in this appendix provide additional detail by division ASL and NSL parts for the open requisitions in the repair parts sample and provide the basis for the summary data used in chapter 2 of the report.
2. The following abbreviations are used in the figures:
  - a. BF - no record status
  - b. AS1 - shipment status
  - c. BB - back order status
  - d. CA - rejected
  - e. BQ - cancelled upon request of the requisitioner
  - f. BR - cancelled, authorized by the requisitioner
  - g. CG - rejected

CATEGORY	n	DOCUMENT DATE TO ASL STATUS (MEAN DAYS)	DOCUMENT DATE TO SAMPLE DATE (MEAN DAYS)	PERCENT ASL STATUS	PERCENT BF STATUS	PERCENT BB STATUS	PERCENT BQ,BR,CG STATUS
ASL	98	25.4	130.3	66.0	20.0	9.0	9.0
NSL	44	43.9	125.4	70.0	16.0	7.0	7.0
AVERAGE ASL/NSL	--	31.1	128.8	67.2	18.8	8.4	5.6

Figure F-1. Open division requisitions submitted to ARMCOM.

CATEGORY	n	DOCUMENT DATE TO REC AT ADSCOM	AVSCOM REC DATE TO ASI STATUS	DOCUMENT DATE TO SAMPLE DATE
ASL	206	3.6	16.4	73.8
NSL	93	3.3	14.5	96.1
AVERAGE ASL/NSL	---	3.5	15.7	80.7

Figure F-2. Open division requisitions submitted to AVSCOM, mean days.

CATEGORY	n	PERCENT ASL STATUS	PERCENT BF STATUS	PERCENT BB STATUS	PERCENT BQ,BR,CG STATUS
ASL	206	51.0	47.0	1.5	.4
NSL	93	63.0	34.3	2.1	1.0
AVERAGE ASN/NSL	---	54.7	43.0	1.7	.6

Figure F-3. Open division requisitions submitted to AVSCOM, analysis of status.

CATEGORY	n	DOCUMENT DATE TO ASL STATUS (MEAN DAYS)	DOCUMENT DATE TO SAMPLE DATE (MEAN DAYS)	PERCENT ASL STATUS	PERCENT BF STATUS	PERCENT BB STATUS	PERCENT BQ,BR,CG STATUS
ASL	215	47.2	72.7	60	19	12	5
NSL	203	57.8	79.7	56	31	8	2
AVERAGE ASL/NSL	---	52.3	76.1	58.1	24.8	10.1	4.3

Figure F-4. Open division requisitions submitted to TACOM.



**APPENDIX G**

**RESULTS OF RESEARCH AT  
STOCK NUMBERS OF AMC NICP'S**

APPENDIX G

RESULTS OF RESEARCH OF

STOCK NUMBERS OF AMC NICP'S

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SECTION I. General

1. SCOPE. This appendix consists of a detailed discussion of 61 stock numbers that were reviewed at AMC NICP's. All AMC NICP's are represented with the exception of MICOM. The stock numbers reviewed were selected from the study repair parts sample with the exception of those reviewed at ECOM. The stock numbers reviewed at ECOM were provided by the Transportation School.
2. PURPOSE. The information contained in this appendix provides the factual background for the majority of the discussion presented in Section II of Chapter 2.
3. PROBLEM AREA CODES. Each of the stock numbers listed in section II of this appendix has a code assigned in subparagraph a. which indicates the type of problem or problems experienced by the particular stock number. The codes are defined as follows:
  - a. A - Administrative leadtime (ALT)
  - b. B - Procurement leadtime (PLT)
  - c. C - Safety level
  - d. D - Requirements determination time (RDT)
  - e. E - Insurance stockage
  - f. F - Transfer of supply management responsibility from one NICP to another
  - g. G - Lack of receipt of supply control studies in a timely manner
  - h. H - Contracts awarded on the basis of preaward surveys
  - i. I - Change in stock number
  - j. J - Rebuild program not adequate to support requirements
  - k. K - Failure to release reserve stocks (not protected) for NORS requirements

- l. L - Failure to initiate procurement action
- m. M - Automated system problems
- n. N - Fluctuations in demand pattern
- o. O - Contractor default

4. ABBREVIATIONS. Abbreviations used in this appendix which have not been previously defined are shown below:

- a. SCS - supply control study
- b. AYD - average yearly demand
- c. AMD - average monthly demand
- d. SL - safety level
- e. DI - due-in
- f. DO - due-out
- g. OH - on hand
- h. MO - month

## Section II. Analysis of Stock Numbers

- 1. FSN 2520-678-8382
  - a. Problem Area Codes. B, H
  - b. Noun. Sprocket, wheel
  - c. Application. M106, M125, M577, M132, XM806, M113A1, M577A1, M132A1, M125A1, M106A1, XM806E1.
  - d. Unit Price. \$72.48.
  - e. Statistics. AYD as shown by consecutive SCS's starting with the SCS dated Aug 72: 994 - 991 - 976 - 2087 - 2078 - 1696 - 1656 - 1108 - 956 - 934 - 1413 - 1122 - 1299 - 1309 - 898 - 877 - 845 - 604 - 422 - 471 - 525
  - f. Discussion.

(1) A decreasing demand pattern has not helped the stockage position for this part. The item is at zero balance and as of the latest SCS there were 1161 each on backorder.

(2) The main problem with this stock number is contractor performance; however, early in the file is evidence of not keeping PLT current with actual conditions. The item manager noted the following statement on the supply control study of November 1972 "Initial Procurement of 13 October 1971 on contract as 1st order is still not shipped/delivered. Procurement and Production states - long lead time item - casting - requires sample approval - acceleration doubtful. Item formerly had PLT of 12 months." At this time procurement leadtime was changed to 11 months. Why PLT was not changed to 12 months is unknown. It seems it should have been based on the information available at the time. At this time there were 2291 each on contract and 762 each on backorder.

(3) An example of the most serious problem with this part is an item manager note on the latest SCS, "Contract requirement December 1973 - 815 each, every month thereafter 600 each. Actual deliveries November 1973 - 300 each, December 219 each, January 150 each; every month thereafter 300 until complete." Additional insight is gained from the following extract from a memo for record in the item managers file concerning the contractor in question:

1. ...the contractors plant has experienced some internal turbulence since the death of the company president. The company is small business. Problems began when Reliable attempted to buy castings.<sup>48</sup> The casting vendor has raised their price after the contract had been awarded. This problem was finally settled with an agreement between Reliable and the casting vendor to accept the increase.

2. Reliable claims they have 150 unfinished wheels in their shop which should be complete by the end of June. Another 150 castings were shipped this week to Reliable. Reliable should be able to complete these in approximately 3 weeks after receipt. Reliable told Mr. Messino they should be able to reach maximum production of 600 per month once the casting vendor finished this process. Mr. Messino is doubtful that Reliable will be able to maintain this rate. Reliable currently has 18 government contracts, all of which are delinquent. Reliable was awarded two more government contracts just recently.

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48. The fictitious name "Reliable" is used in lieu of the actual name of the contractor.

(4) The last sentence above could be explained by a sole source situation. In order to find out if this was the case a sample of the delinquent contracts with Reliable were reviewed. The results are explained in the following paragraphs.

(5) Contract number DAAE07-72-D-0137, FSN 2520-687-8382, carrier, sprocket, contract cost: \$337,179.46.

(a) Contract history:<sup>49</sup>

<u>Delivery Order No.</u>	<u>QTY</u>	<u>Award Date</u>	<u>Original Schd</u>
0001	815	6 Apr 72	3 Oct 72
0002	1,344	4 May 72	4 Dec 72
0003	282	7 Jun 72	4 May 73
0004	500	19 Jul 72	4 Jun 73
0005	526	27 Sep 72	5 Jul 73
0006	1,831	18 Dec 72	6 Sep 73

(b) All delivery order schedules have been revised at least twice. Delivery order 0001 has been revised three times.<sup>50</sup>

(c) The contractor is also delinquent based upon the revised delivery schedules, only 500 parts have been shipped. The Production Division's forecast is that the contractor will never get back on schedule and will probably never average more than 300 items delivered per month.<sup>51</sup>

(d) In addition to Reliable there were seven other bidders for the above contract. Reliable was the low bidder and had a favorable preaward survey.

(6) Contract number DAAE07-72-C-0630, FSN 2520-740-9589, Power Take Off Assembly, contract cost: \$18,304.

(a) Contract history: Original schedule, 5 February 1973 - 95 each; revised schedule, 20 October 1973 - 95 each.<sup>52</sup>

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49. Memorandum for record, AMSTA-ICTA, USATACOM, 21 Jan 74, subject: Performance Evaluation, page 1.

50. Ibid., page 1

51. Ibid., page 2.

52. Ibid., page 2.

(b) The contractor requested that the delivery schedule be revised to 30 April 1974.<sup>53</sup>

(c) In addition to Reliable there were two other bidders for the above contract. Reliable was the low bidder and had a favorable preaward survey.

(7) Contract number DAAE07-74-C-0954, FSN 2520-706-1137, Power Take Off Assembly, contract cost: \$83,607.50.

(a) The original delivery schedule called for delivery of the contract quantity, 631, on 19 January 1974. The contractor requested that the delivery schedule be revised as follows: May 30, 1974 - 157, June 30 1974 - 158, July 30, 1974 - 158, and August 30, 1974 - 158.<sup>54</sup>

(b) In addition to Reliable one other contractor was a bidder on the above contract. Reliable was the low bidder and had a favorable preaward survey.

(8) Contract Number DAAE07-73-C-4832, FSN 2520-740-9580, Power Take Off Assembly, contract cost: \$79,918.75.

(a) The original contract delivery schedule called for delivery of the entire quantity, 575 each, by 30 June 1974. The contractor requested that the schedule be revised to provide for delivery of 143 by 30 May 1974; and 144 each on 30 June, 31 July, and 31 August 1974.<sup>55</sup>

(b) In addition to Reliable there were four other bidders for the above contract. Reliable was the low bidder and also had a favorable preaward survey.

(9) Contract Number DAAE07-73-C-3097, FSN 2510-299-9049, Cover Floor Drain, contract cost: \$11,037.25.

(a) The original delivery schedule called for delivery of 265 each by 23 July 1973 and 60 each by 7 August 1973. The original schedule was revised to provide for delivery of 325 each by 30 November 1973. The Production Division's estimate for delivery was March 1974.<sup>56</sup>

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53. Ibid., page 2.

54. Ibid., page 3.

55. Ibid., page 3.

56. Ibid., page 3.

(b) In addition to Reliable, there were eleven other companies that submitted bids for the above contract. Reliable was the low bidder. The award was made to Reliable without a preaward survey.

(10) Contract number DAAE07-73-C-4577, FSN 2520-735-9096, Gear Assembly, contract cost: \$6,532.94.

(a) The original schedule called for delivery of the contract quantity of 82 each by 24 December 1973. As of 7 January 1974 the contractor did not have any material. The Production Division's estimate for completion of the contract was the end of April 1974.<sup>57</sup>

(b) In addition to Reliable there was one other bidder for the above contract. The procurement was made using small purchase procedures. Reliable was the low bidder and no preaward survey was conducted.

(11) Contract number DAAE07-73-C-1714, FSN 2805-759-5405, Bench Gear Set, contract cost: \$61,739.07.

(a) The original delivery schedule called for delivery of 2046 each by 8 June 1973, and 410 each by 10 September 1973. The schedule was revised to provide for delivery of 2046 each by 31 August 1973, and 410 each by 15 September 1973. The contractor requested an additional change in the delivery schedule to 28 February 1974 for the complete contract quantity.<sup>58</sup>

(b) In addition to Reliable there were nine other bidders for the above contract. Reliable was the low bidder and was judged responsive by the Production Divisions Capability Report dated 20 December 1972. No preaward survey was conducted.

(12) Contract number DAAE07-73-C-2820, FSN 2530-125-8721, Brake Drum, contract cost: \$58,291.16.

(a) The original delivery schedule called for delivery of the contract quantity, 3242, by 5 October 1973. The contractor requested a change in the delivery schedule as follows: January 1974 - 300 each, February through June 1974 - 500 each, and July 1974 - 458 each.<sup>59</sup>

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57. Ibid., page 4.

58. Ibid., page 5.

59. Ibid., page 6.

(b) In addition to Reliable one other company was a bidder for the above contract. Reliable was the low bidder and was awarded the contract without a preaward survey.

(13) Contract number DAAE07-73-C-4520, FSN 2530-701-4068, Seat Shackle Bearing, contract cost: \$18,424.92.

(a) The original delivery schedule required delivery of the contract quantity of 2897 items by 7 November 1973. The complete job was sub-contracted to a contractor in Cleveland, Ohio. However, the sub-contractor's performance was no better than Reliable's. No shipments have been made and completion was expected in March or April 1974.<sup>60</sup>

(14) Contract number DAAE07-73-C-1235, FSN 2520-740-9669, Gear Case, contract cost: \$26,378.00.

(a) The original schedule called for delivery of 62 each by 18 February 1973 and 48 each by 7 May 1973. The schedule was revised twice. The first revision was for delivery of 110 each by 31 July 1973. The second revision was for 62 each by 30 October 1973, and 48 each by 30 November 1973. Sixty-two were shipped on 25 October 1973, but the balance of 48 each slipped to 30 April 1974.<sup>61</sup>

(15) Contract number DAAE07-74-C-5295, FSN 2590-722-3631, Lever, Remote Control, for 1400 pieces.

(a) This is the most current contract with Reliable. In addition to Reliable, there were eight other bidders for the above contract. Reliable was the low bidder and received a favorable preaward survey.

(16) In view of its past delivery performance, it was hard to understand why contracts were continually awarded to this company. It appears that the combination of a low bid and a favorable preaward survey are the only criteria that are being used.

2. FSN 2520-781-8311

- a. Problem area codes. B, N
- b. Noun. Housing
- c. Application. M113A1, M577A1, M106A1, M125A1, M132A1, XM806E1

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60. Ibid., page 4.

61. Ibid., page 5.



d. Unit price. \$42.93.

e. Statistics . AYD as shown by consecutive SCS's starting with the SCS dated Jun 72: 6 - 8 - 11 - 11 - 13 - 17 - 18 - 19\* - 19 - 22 - 46 - 76 - 75 - 52 - 62.

f. Discussion. Demands are increasing but the part is already in trouble at the point marked by the asterick, August 1973. At this time SL = 5.7 months, RDT = 0, ALT = 2.7 months, and PLT = 4.0 months. The part remained at zero balance up to the present time. The basic problem was late contract deliveries. The item manager changed the PLT to nine months after our discussion.

3. FSN 2990-572-8649

a. Problem area code. 0

b. Noun. Elbow

c. Application. M113A1, M577A1, M123A1, M106A1

d. Unit Price. \$22.75.

e. Statistics. Demand and inventory policy not a factor in this case.

f. Discussion.

(1) The part was at zero balance due to the fact that the contractor defaulted. Prior to the award of this contract the company consisted of two employees; the owner and his wife. The preaward survey indicated that help would be hired as needed to perform on this contract if awarded.

(2) As of the lastest SCS there were 1113 each of these exhaust elbows on backorder: 60 each NORS, 75 each high priority, and 978 each routine. The estimated get well date was November 1974. At the present time SL = 1.9 months, ALT = 8.2 months, and PLT = 4.3 months.

(3) No reasonable inventory policy can be developed to consider possible contractor default. The situation was complicated, however, by plans, which were later canceled, to repair defective parts. In the meantime procurement was deferred.

4. FSN 2590-999-2335

- a. Problem area codes. A, B, C, L, N
- b. Noun. Bracket
- c. Application. XM741, M548
- d. Unit price. \$38.46
- e. Statistics. AYD as shown by consecutive SCS's starting with the SCS dated Feb 73: 48 - 47 - 52 - 361 - 323 - 324.

f. Discussion:

(1) This item was in pretty good shape until March 1973. At this time the ISO quantity (rebuild requirements) was changed by the item manager and shouldn't have been; therefore, the study recommended buy of 240 parts was not made. Also at this time there was no safety level established.

(2) During April 1973 two large requisitions wiped out the stock on hand and put the part in a back order position. A safety level had not yet been established. The study recommended procurement of 394 each was canceled by the procurement directorate with no reason indicated in the item managers file.

(3) As of May 1973 ISO consumption was higher than forecast and was put into annual yearly demand. AYD jumped from 52 each to 361 each. The study recommended buy was canceled because there were no 73 funds. A safety level is now established of 4.7 months.

(4) There are also indications of procurement problems. For example, procurement requests for quantities of 65, 411, and 194 dated June 1973. The first indication of a contract for these is the supply control study dated January 1974, a period of seven months, compared to an ALT currently being used of 2.5 months. Current contracts are taking about 10 months compared to the supply control study figure (2.5 for ALT, and 3.9 for PLT) of 6.4 months.

5. FSN 2930-864-2949

- a. Problem area codes. C, D, N
- b. Noun. Manifold
- c. Application. M548, XM741, XM727, XM730, M113  
Family
- d. Unit price. \$4.89
- e. Statistics. AYD as shown by consecutive SCS's starting with the SCS dated April 1971: 731 - 813 - 500 - 160 - 152 - 154 - 143 - 138 - 135 - 178 - 205 - 1102 - 1099 - 656 - 701 - 764 - 660 - 709 - 941 - 834 - 878 - 908 - 780 - 810 - 937.
- f. Discussion. The procurement leadtime used in inventory policy tracked closely with actual experience. However, the item was at zero balance for most of the file. The file contained data from 1971 but no safety level was established until March 1973. It appears that the part keeps getting into trouble for a combination of reasons: the lack of any requirements determination quantity, a low safety level of 1.4 months, and high variation in the demand pattern.

6. FSN 6115-783-6954

- a. Problem area codes. E, L
- b. Noun. "A" Frame
- c. Application. M113 family
- d. Unit price. \$350.00
- e. Discussion. This item was designated as an insurance item. As of 12 June 1974 the item was at zero balance with 21 each on back order, 3 each due-in from procurement, and 18 each due-in not on contract with procurement actions being processed. The item had a numerical stockage objective of 8 each but these were not on order.

7. FSN 3020-181-3068

- a. Problem area codes. B, C, N
- b. Noun. Pulley
- c. Application. M113A1, M577A1, M106A1, M125A1
- d. Unit Price. \$34.57
- e. Statistics. AYD as shown by consecutive SCS's starting with the SCS dated Sep 72: 491 - 529 - 1462 - 1452 - 1450 - 1449 - 666 - 701 - 1419 - 1344 - 1342 - 1337 - 722 - 740 - 758 - 789 - 807 - 781 - 805.
- f. Discussion.

(1) The item was at zero balance at the time of the study. A contributing factor may be the high variance in the demand pattern.

(2) The major problem, however, is a history of late deliveries from contracts and failure to adjust inventory policy accordingly. A contract for 123 parts, procurement request date June 1972, scheduled for delivery by November 1972, was actually delivered between June 1973 and July 1973, a period of approximately one year. At this time, study procurement leadtime is nine months. The item manager is three months short of reality. Another example, a contract for a total of 2131 parts based upon 11 procurement requests dated from July 1972 to December 1972, for delivery in October 1973. As of November 1973 still waiting for 1864 parts to be delivered, as of December 1973 still waiting for 1858 parts, as of January 1974 still waiting for 1472 parts, and as of May 1974 still waiting for 146 parts. The time from first procurement request to the latest study is 666 days, i.e., 22 months. As of last study date study procurement leadtime is 14 months. The item manager is about 8 months deficient in his inventory policy.

(3) As of current study the safety level is only 1.9 months.

8. FSN 6680-918-0575

- a. Problem area code. A
- b. Noun. Adapter, speedometer
- c. Application. M551

d. Discussion.

(1) Demands were fairly consistent and not a factor in this case.

(2) The item was in good shape until the supply control study dated April 1973. At this time 24 were on backorder. The item managers decisions were correct, however, procurement requests were not awarded. The file indicates a problem in finding a bidder. The following is quoted from a DF from the Procurement Directorate: "Item was supplied to Cleveland Truck Plant, Div GMC, by Barbour Stockwell, who has since ceased production on item and made no overruns; therefore, unable to procure."

(3) A contract with Curtis Manufacturing Company was finally made to supply this part. The item manager didn't have the date of the contract. The first procurement requests were made July 1972, and receipt is expected July 1974; therefore, it took roughly two years to get the part.

(4) As of the latest SCS the item was at zero balance with 171 each on backorder, of these 126 each were high priority and 45 each were routine. Inventory policy was SL = 4.2 months, ALT = 3.0 months, and PLT = 6.0 months.

9. FSN 2920-990-9153

a. Problem area code. A

b. Noun. Bracket

c. Application. M551

d. Unit Price. \$35.24

e. Discussion.

(1) This item has a history of procurement difficulty. The item manager apparently kept inventory policy current. The file does not contain all consecutive supply control studies therefore it was not possible to trace inventory policy, demands, and contractor performance with any accuracy.

(2) Contracting difficulties are indicated, however, because an effort was made to determine the feasibility and cost of fabrication. A cost estimate is in the file for 100 each for a total cost of \$18,823.00. This was later canceled due to availability of the part from a commercial source.

(3) As of the latest SCS, the item was at zero balance with 162 each on back order, of these 11 each were NORS, 48 each high priority, and 103 each routine. The total due-in was 701 each and the estimated get well date was October 1974.

10. FSN 2590-930-8932

- a. Problem area codes. B, N
- b. Noun. Throttle, remote control
- c. Application. M551
- d. Unit Price. \$11.50
- e. Statistics. AYD beginning with the SCS dated September 1972: 23 - 34 - 43 - 90 - 261 - 333 - 475
- f. Discussion.

(1) The file does not contain all of the consecutive supply control studies; therefore, demand history begins with the SCS dated September 1972. The demand pattern shows a continuing increase in requirements.

(2) This item was in good shape until March 1973 at which time demand increased and caused a backorder status. At this time the item had the following inventory policy: SL = 6.0 months, ALT = 3.0 months and PLT = 6.0 months.

(3) A number of studies were missing so it was not possible to trace procurements during this period, however ALT was apparently increasing because as of August 1973 ALT had been increased to 7.1 months.

(4) Contracting delays are indicated by a remark in the file that the delivery scheduled for 24 August 1973 was delayed to overload and is now scheduled for 29 November 1973. This is a slippage of three months. Another contract with an initiation date of March 1973 and delivery date of August 1973 was still not delivered as of 20 March 1974, a delay of seven months. There is no indication in the file that this contract was delivered.

(5) As of the latest SCS inventory policy was as follows: ALT = 7.1 months, PLT = 6.0 months, and safety level = 4.3 months.

(6) There is a DF in the file which indicates that the item has an abnormal fail rate. Based upon the number of end items fielded the replacement rate for this part has been 40 percent.

11. FSN 2920-945-7512

- a. Problem area code. B
- b. Noun. Drive assembly, generator
- c. Application. M551
- d. Discussion.

(1) Demands were not tracked in detail for this item; however, the part is a high demand item.

(2) One problem with this item is that inventory policy was not adjusted to keep pace with increasing procurement leadtimes. Four procurement request dates and contract delivery dates were checked with the following times required: 11, 18.3, 18.3 and 16.0 months. The ALT being used was 4.2 months, the PLT 6.6 months; a total of 10.8 months. This is 5.2 months less than the earliest delivery date that can be expected based upon recent contract experience.

12. FSN: 2910-917-4735

- a. Problem area code. A, B, H
- b. Noun. Parts kit, carburetor
- c. Application. Military Standard Engine.
- d. Unit Price. \$29.77

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Dec 73</u>	<u>Aug 74</u>
ALT	4 MO	3 MO	4 MO
PLT	5 "	6 "	8 "
SL	1 "	2 "	1.5 "
AMD	181	189	857
DI	nd	nd	20813
DO	nd	nd	2613
OH	nd	nd	0

f. Discussion. Of an original shipment of 8862 kits received from Bendix, 1532 were defective. In view of quantity DI, it was estimated that 19 November 74 could be expected as the get-well date. Premium pay was offered to the contractor for early delivery but has not been accepted. The latest contract was awarded in April for delivery in October 1974. Average monthly demands and ALT/PLT had exceeded that which was recorded in the Master Data Record, and by January 1974 there were 137 high priority requisitions for 341 kits. Despite previous defective kits received from Bendix, 20 parts kits were shipped to them for testing and/or repair in February 1974. The problem with this item has continued for some time.

13. FSN 4310-181-8895

a. Problem area code. A, B, J, L

b. Noun. Compressor

c. Application. M551

d. Unit price. \$2,157.00

e. <u>Statistics.</u>	<u>1Q74</u>	<u>2Q74</u>	<u>3Q74</u>	<u>4Q74</u>	<u>1Q75</u>	<u>2Q75</u>	<u>3Q75</u>
Requirements	220	162	162	138	90	90	90
Due-In							
Overhaul	25	75	75	75	75	75	75
Current Contract		77	29		29	105	106
Net Supply Position	-195	-10	-58	-63	14	140	409

f. Discussion. The shortfall through the 4th quarter 1974 was due to insufficient provisioning after a modification of the item and leadtime associated with the procurement process. Overhaul was complicated by the shortage of some required repair parts and insufficient numbers of unserviceable returns for overhaul. Delinquent contract delivery was due also to strikes. Efforts were made to obtain support from the Navy without effective results. There was extreme interest indicated by all levels due to high failure rates and funding difficulties. In August 1973, \$1.4 million had been requested to support unprogrammed requirements. Allocations are being made by DA, regardless of MILSTRIP priority, because of the problems stated.



14. FSN 1005-888-4000

a. Problem area code. A, D

b. Noun. Slip ring

c. Application. M163

d. Unit price. \$790.00

e. <u>Statistics.</u>	<u>Jan 74</u>	<u>Aug 74</u>
ALT	6 MO	6 MO
PLT	12 "	12 "
SL	6.6 "	5 "
AMD	1	2
DI	25	77
DO	14	28
OH	0	0

f. Discussion. The ALT, shown as 6 months in the Master Data file, was running as much as 15 months in actual experience. The long ALT was due to lack of responsive bidding because of possible engineering requirements. A waiver was fully granted on these requirements. After bidding was resolved additional funds were required. The request for procurement was made 1 January 1973 but the requirement was not placed on contract until 23 May 1974. A further request was made on 5 July 1973 and a contract was awarded 1 March 1974 for delivery in May 1974.

15. FSN 1240-077-1688

a. Problem area code. A, B, D

b. Noun. Power Supply, IFR

c. Application. M48A3, M60A1

d. Unit price. \$69.80

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Dec 73</u>	<u>Aug 74</u>
ALT	3 MO	3 MO	5 MO
PLT	12 "	12 "	10 "
SL	1 "	1 "	2.2 "
AMD	43	43	125
DI	2160	2160	3260
DO	504	1091	1089
OH	19	5	0

f. Discussion. Both the ALT and the PLT actual times exceeded those used in the supply studies. The actual times were 5 1/2 months ALT and 15 months PLT. Demands had increased by approximately 35 percent during the past two years. Increasing demands and excessive procurement leadtimes caused the item to be at zero balance.

16. FSN 1240-407-2788

- a. Problem area code. B, D
- b. Noun. Shield Assy, M119 Periscope
- c. Application. M60, M728
- d. Unit price. \$21.25

e. <u>Statistics.</u>	<u>Sep 73</u>	<u>Jul 74</u>
ALT	3 MO	3 MO
PLT	7 "	7 "
SL	5 "	5 "
AMD	14.5	22
DI	400	130
DO	0	42
OH	8	32

f. Discussion. Late delivery of castings caused slip-page in deliveries and had resulted in OH quantities sufficient only to fill NORS requests.

17. FSN 1240-990-8245

a. Problem area code. D, L

b. Noun. Window, M32 Periscope

c. Application. M60A1

d. Unit price. \$32.84

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	3 MO	3 MO
PLT	7 "	7 "
SL	4 "	2 "
AMD	30	12
DI	270	1360
DO	208	195
OH	0	42

f. Discussion. Procurement action during 1973 was insufficient to insure adequate stocks to support demands and zero balances had resulted.

18. FSN 1025-821-2457 or 1025-186-0031

a. Problem area code. D, I, L

b. Noun. Plate, Carrier Assy

c. Application. M109

d. Unit price. \$3.09

e. <u>Statistics.</u>	<u>Mar 73</u>	<u>Aug 74</u>
ALT	3 MO	3 MO
PLT	7 "	7 "
SL	1 "	3 "

AMO	12	31
DI	0	750
DO	4	76
OH	6	354

f. Discussion. A change in stock number in late 1972 and early 1973 had confused the number of demands, submission of procurement requirements, and the true stock position, resulting in zero balances.

19. FSN 1025-945-4321

a. Problem area code. A, B, D

b. Noun. Cable Assy

c. Application. M551, ARAAV

d. Unit price. \$464.00

e. Statistics. May 74

ALT	3 MO
PLT	7 "
SL	5 "
AMD	35
DI	140
DO	173
OH	0

f. Discussion. ALT was running double the time shown in the study printouts. Contractor delinquency was also a problem. For example, a request for procurement was made 27 May 1973, the award was made 2 November 1973 for delivery in February 1974, but as of 4 September 1974 the contractor had not delivered. The delay was due to contractor problems in obtaining a part (connector), which was sole source, and because of a health hazard in the contractors plant. The delivery date had been postponed until August 1974, but as of 4 September 1974 delivery had not been made resulting in a zero balance.

20. FSN 1025-908-8275

a. Problem area code. A, B, D, H, L

b. Noun. Cable Assy

c. Application. M551, ARAAV

d. Unit price. \$55.23

e. <u>Statistics.</u>	<u>Nov 73</u>	<u>Mar 74</u>
ALT	3 MO	3 MO
PLT	7 "	7 "
SL	6 "	6 "
AMD	7	9
DI	48	304
DO	15	70
OH	0	0

f. Discussion. The ALT used in supply studies was three months while the actual time was eight months. This contributed to the zero balance problem. In addition, contractor performance had been considered unsatisfactory by procurement personnel. A preaward survey by DCAS had indicated the contractor would be satisfactory, therefore the award was made. The overall problem was that supply studies provided a set ALT and PLT which were not the actual times; therefore, purchase quantities predicated on these were in error from the beginning and did not provide sufficient buys to support demands. Since open end or requirements type contracts could not be initiated except for commercial or commercial modified items, option to buy an additional percentage of the amount of the contract had been established. Action to buy additional quantities on this item had not been made, although a request by Supply Management personnel to do so was made 19 June 74.

21. FSN 5977-763-0833

a. Problem area code. A, D, G, K

b. Noun. Motor Brushes

c. Application. M551, ARAAV

d. Unit Price. \$1.15

e. Statistics. Mar 74

ALT	3 MO
PLT	7 "
SL	4 "
AMD	100
DI	3816
DO	260
OH	53 (Held for Priority)

f. Discussion. The ALT used in supply studies was three months; however, the actual time was eight months. No supply study printouts have been received since March 1974. All NORS requests had been shipped by 5 September 1974, but routine requests could not be filled.

22. FSN 5310-916-2197

a. Problem area code. D, G, K

b. Noun. Nut

c. Application. M551, ARAAV

d. Unit price. \$95.00

e. Statistics. Feb 74

ALT	3 MO
PLT	7 "
SL	6 "
AMD	16
DI	504
DO	22
OH	5 (Reserved for mobilization requirements)

f. Discussion. There had been no quarterly supply study printouts since February 1974. The quantity on hand could have been released to fill due-out NORS requisitions. The files revealed that 96 each had been received 22 March 1974 and all backorders were filled 29 March 1974.

23. FSN 1025-134-3052

a. Problem area code. A, B, D, L

b. Noun. Power Supply

c. Application. M551

d. Unit price. \$211.00

e. <u>Statistics.</u>	<u>Aug 73</u>	<u>May 74</u>
ALT	2 MO	2 MO
PLT	9 "	12 "
SL	--	2.7 "
AMD	13.3	33
DI	284	1331 (411 on contract)
		(920 not on contract)
DO	178	727
OH	199*	0

\*In litigation (Repair impossible)

f. Discussion. Item had been at zero balance since August 1973. The first delivery was due the end of August 1974 with a get well date of December 1974. An ALT of two months was used in supply studies; however, actual ALT was five months. The PLT had been extended at the request of the contractor for deviations in drawing specifications. Forty-three changes to the original drawings were made in May 1974. The original contract for 284 each was modified and increased by 127, for a total of 411. A delay from 9 October 1973 to 4 January 1974 was experienced in resolving Supplementary Quality Assurance Provisions (SQAP) before buying the supplies required to manufacture the end item. A request for 920 was made 27 February 1974, but technical data was not received until 3 April 1974. The solicitation was made 14 May 1974 and bid opening was extended from 3 June 1974 to 8 July 1974.

The lowest bidder failed to file a certificate of competency and the second lowest bidder was declared non-responsive because he failed to return a required amendment. The award was made to the third lowest bidder. All of this had resulted in zero balances.

24. FSN 1025-736-0245

- a. Problem area code. A, D, L
- b. Noun. Valve Control - Loader/Rammer & Spade
- c. Application. M110
- d. Unit price. \$82.29

e. <u>Statistics.</u>	<u>Mar 74</u>	<u>Jul 74</u>
ALT	3 MO	3 MO
PLT	6 "	6 "
SL	6 "	4 "
AMD	7.5	8
DI	374	374
DO	359	475
OH	0	0

f. Discussion.

(1) A quantity of 598 received in September 1973 was defective and the contractor subsequently went out of business. An attempt to modify defective valves was unsuccessful. Current procurement actions were as follows: a quantity of 204 each requested 7 June 1973, awarded 17 June 1974, for delivery 22 January 1975; 170 each requested 27 March 1973, awarded 17 May 1974, for delivery 22 January 1975. The ALT used in supply studies was 3 months, while actual times for the foregoing procurement actions were 11 and 13 months respectively.

(2) The history of this item from a procurement standpoint is that it was a Small Business Set Aside (SBSA) originally. The item was then taken off of SBBSA and an unrestricted solicitation was made on 14 January 1974. A bid which was considered too high, was received from only one contractor. Negotiation was then undertaken to bring the price



into line. As a result, the price was reduced from \$122.00 to \$61.40. The time required for these negotiations ultimately resulted in zero balances.

25. FSN 5820-943-9250

a. Problem area code. A, B, C, D

b. Noun. Protection Circuit Assy

c. Application. AN/GRC-106

d. Unit price. \$31.41

e. <u>Statistics.</u>	<u>Jul 73</u>	<u>Sep 73</u>	<u>Apr 74</u>	<u>Aug 74</u>
ALT	3 MO	3 MO	3 MO	4 MO
PLT	6 "	6 "	8 "	4 "
SL	1 "	2 "	1 "	1 "
AMD	4	8	19	14
DI	0	135	300	435
DO	60	60	*157	118
OH	2	2	0	0

\*High Priority

f. Discussion. A quantity of 135 each was requested 18 July 1973, the award was made 26 April 1974, for delivery 16 July 1974. This quantity had not been delivered as of 9 September 1974. This item is considered a hard, hard core item, which is a term meaning it had more than 50 lines due out. On 22 April 1974, 300 each were requested but the request was not received in procurement until 1 June 1974. No information had been furnished as to the status of procurement action and no information would be forthcoming without submission of a written request from Supply Management. The result was zero balances and lack of effective followup actions.

26. FSN 5821-134-5957

a. Problem area code. A, B, D

b. Noun. Filter and Relay Assy

c. Application AN/ARC 114

d. Unit price. \$147.00

e. <u>Statistics.</u>	<u>Jun 73</u>	<u>Jul 74</u>
ALT	3 MO	3 MO
PLT	9 "	18 "
SL	3 "	3 "
AMD	2	2.5
DI	217	221
DO	70	0
OH	2	6

f. Discussion. A new procurement request was initiated 1 April 1974 for 205 parts, but the request was delayed until after 1 July 1974 because Fiscal Year 1974 funds were not available. Review of the item folder indicates that the part has been in poor condition for two years. The item will be at zero balance before delivery is received on the new procurement. A 100% option had been requested to the original contract, but procurement did not incorporate more than a 50% option due to the possibility of a delay in award. Previous experience had indicated a PLT of 21 months as opposed to the 18 months shown in the July 1974 study printout.

27. FSN 3820-853-5915

a. Problem area code. D, J

b. Noun. Oscillator Module

c. Application. AN/URC-12

d. Unit price. \$75.81

e. <u>Statistics.</u>	<u>Oct 72</u>	<u>Apr 74</u>
ALT	3 MO	4 MO
PLT	10 "	10 "
SL	3.1 "	1.4 "
AMD	274	455

DI	3248 (Overhaul)	5392 (Overhaul)
	2890 (Procurement)	1209 (Procurement)
DO	476	127
OH	0	23

f. Discussion. The item was classified as hard, hard core in April 1974 because the number of lines DO exceeded 50. There appeared to be adequate stocks in both overhaul and procurement. There have been short delays in procurement awards due to AMC fund restrictions. Projection of rebuild history indicates the item was not intended to be a repairable item and those which had been repaired had reached an uneconomical repair point. A requirements type contract was being negotiated at the time of the visit, which should relieve the present problem.

28. FSN 6110-497-9074

a. Problem are code. A, D

b. Noun. Voltage Regulator

c. Application. PU-540

d. Unit price. \$94.51

e. <u>Statistics.</u>	<u>Aug 73</u>	<u>Aug 74</u>
ALT	3 MO	3 MO
PLT	9 "	9 "
SL	2 "	3 "
AMD	15.5	17.7
DI	39	33 (Overhaul)
		1194 (Procurement)
DO	20	400
OH	0	0

f. Discussion. The ALT used in supply studies was three months while the actual ALT was 9 months. The high ALT was attributed to the move from Philadelphia in the 4th quarter Fiscal Year 1974 and to a change of the stock number. To

resolve logistic problems a single regulator was designed to replace the nine stock numbers previously in the inventory. The item had been zero balance for most of a year.

29. FSN 5831-935-0085

a. Problem area code. A, D, G

b. Noun. Amplifier Sub Assy

c. Application. C1611/ATC

d. Unit price. \$27.96

e. <u>Statistics.</u>	<u>Oct 72</u>	<u>July 74</u>
ALT	3 MO	3 MO
PLT	10 "	9 "
SL	1.5 "	3 "
AMD	64	128
DI	1066	2775
DO	97	1782
OH	44	16

f. Discussion. The get well date appeared to be May 1975. There was no supply study in the file for the period October 1972 to July 1974. A lack of procurement action appeared to be the problem. A contract was requested 1 June 1973 and was not awarded until May 1974, an eleven month ALT. A number of requests were consolidated into one contract to reduce PLT and obtain a better price.

30. FSN 5826-058-1111

a. Problem area code. A, B, D

b. Noun. Mixer/lF Module Assy

c. Application. AN/ARN 89

d. Unit price. \$323.00

e. <u>Statistics.</u>	<u>Feb 73</u>	<u>Jun 74</u>
ALT	3 MO	3 MO
PLT	9 "	9 "
SL	1.5 "	1.5 "
AMD	4	14
DI	160	190
DO	153	126
OH	3	0

f. Discussion. The ALT used in the supply control study was 3 months; however, actual experience was 9 months. Back-orders have not been effectively reduced due to delay in the award of procurement requests. Delay in award had been further lengthened due to an increase in unit price, which had doubled since the funds were obligated. These funds were suspended pending release of additional obligation authority to accommodate the increased price. The result was zero balance.

31. FSN 5896-089-8010

a. Problem area code. A, D, J, L

b. Noun. Transmitter, Oscillator

c. Application. RT-859/APX-72

d. Unit price. \$225.00

e. <u>Statistics.</u>	<u>Aug 74</u>
ALT	6 MO
PLT	4 "
SL	3 "
AMD	14
DI	448
DO	224
OH	0

f. Discussion. The Navy procures this item and manages it as a throwaway item (non-reparable). The item had been improperly identified as reparable by the NICP. Procurement was delayed due to improper identification, cancellation of a fiscal year 1973 procurement request due to lack of funds, and a reduced obligation authority by AMC.

32. FSN 5821-489-6094

a. Problem area code. D, J, L

b. Noun. Circuit Card Assy

c. Application. AN/ARC 116

d. Unit price. \$250.00

e. <u>Statistics.</u>	<u>Oct 74</u>	<u>Jan 74</u>
ALT	3 MO	3 MO
PLT	12 "	12 "
SL	3 "	3 "
AMD	8	10.1
DI	40(Field returns) 70(Procurement)	140(Field returns) 63(Overhaul release)
DO	117	115
OH	0	0

f. Discussion. A quantity of 190 each were requested on 22 January 1974 as a result of the January 1974 supply control study. However, the request was not received in procurement for action until 16 July 1974. The delay was due to lack of fund approval until June 1974. A review of the item folder revealed a continuous zero balance with many due-outs for over six months. More timely buying would have precluded this out of stock condition.

33. FSN 5821-689-6272

a. Problem area code. A, B, D, J, L

b. Noun. Circuit Card Assy

c. Application. AN/ARC 114

d. Unit price. \$309.00

e. <u>Statistics.</u>	<u>Jul 73</u>	<u>Apr 74</u>
ALT	3 MO	3 MO
PLT	12 "	12 "
SL	3 MO	1.8 MO
AMD	5	20
DI	58(Field return)	16(Overhaul)
	231(Procurement)	888(Field return)
		231(Procurement)
DO	41	120
OH	0	0

In October 1972, 116 each were requested, the award was made in April 1973, and the contractor delivered in July 1974; a total procurement leadtime of 21 months. In another case 115 each were requested in November 1972. An award was not made as of the time of the study team's visit.

f. Discussion. The problem may have been generated by inattention. No study has been made since April 1974, and the one that should have been made was two months overdue. The item is classified as Direct Exchange Wholesale (DXW) but this status may be nullified by the lack of returns from the field and few items available for overhaul. There does not appear to be adequate backup quantities to support a true DXW program. The current get well date is July 1975. Delays in procurement action due to fiscal year 1974 fund restrictions have resulted in an ALT of 24 months, in some cases.

34. FSN 5821-142-5519

a. Problem area code. A, D, L

b. Noun. Circuit Cord Assy

c. Application. RC-114 & 114A

d. Unit price. \$178.00

e. <u>Statistics.</u>	<u>Apr 73</u>	<u>Aug 74</u>
ALT	3 MO	3 MO
PLT	10 "	10 "
SL	3 "	3 "
AMD	9.9	8
DI	32 (Overhaul)	75 (Overhaul)
	366 (Procurement)	111 (Field repair)
		366 (Procurement)
DO	131	14
OH	0	0

f. Discussion.

(1) Three contracts were requested; however none was awarded as shown below:

(a) 117 each requested June 1972, received in Procurement September 1972;

(b) 155 each requested January 1974, received in Procurement April 1974;

(c) 48 each requested May 1974, received in Procurement June 1974;

(d) 201 each requested August 1974, received in Procurement date unknown.

(2) Review of the item manager's folder indicated that the problem had existed since early 1973. The 117 each was actually awarded but the successful contractor stated that the award had never been received by him. This resulted in a renegotiation of the contract. The zero balance had existed for more than a year.

35. FSN 5826-883-1628

- a. Problem area code. A, B, D
- b. Noun. Geniometer Module Assy
- c. Application. AN/ARN 89
- d. Unit price. \$517.00



d. Unit price. \$517.00

e. <u>Statistics.</u>	<u>Aug 73</u>	<u>June 74</u>
ALT	3 MO	3 MO
PLT	9 "	12 "
SL	3 "	3 "
AMD	9 "	12 "
DI	23 (Field repair)	135 (Overhaul)
	25 (Overhaul)	145 (Procurement)
	213 (Procurement)	
DO	100	40
OH	7*	7*

\*Unserviceable

f. Discussion. The ALT used in supply studies was three months while the actual ALT was 10 months. The long ALT and the increased PLT appeared to be the cause of the zero balance, which had been a problem for most of a year.

36. FSN 1615-071-4523 or 3040-134-8117

a. Problem area code. B, L, I

b. Noun. Pitch Links

c. Application. CH-47

d. Unit price. \$485.00

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 73</u>
ALT	1 MO	1 MO
PLT	11 "	11.6 "
SL	2.7 "	1.3 "
AMD	8.2	6.7
DI	431	404
DO	213	202
OH	0	0

f. Discussion. Delinquent deliveries have continued to plague management. The contractor had problems with the availability of bearings to manufacturer the part. The zero balance condition has existed for most of a year and expedite actions have not been successful in relieving the situation. Twenty each were to be delivered in September 1974 and 6 each in October 1974, but these would not satisfy the 97 high priority backorders.

37. FSN 1615-001-6443 or 1615-176-2111

a. Problem area code. B, C, K, I

b. Noun. Internal Spar Inspection System (ISIS)

c. Application. UH-1

d. Unit price. \$21.04

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	1 MO	1 MO
PLT	20 "	20 "
SL	nd	nd
AMD	17.8	19.2
DI	116	108
DO	59	52
OH	5	51

Additional OH quantities, as of October 1973, consisted of 291 each in overhaul and 219 unserviceable. Additional OH quantities, as of August 1974, consisted of 51 each reserved for NORS requisitions and 141 each unserviceable.

f. Discussion. Inspections for corrosion resulted in a surge in replacement demand in 1973. Those parts with 400 hours or two years of use were removed and replaced. The Korea Air Force requested 200 each at one time causing a zero balance in January 1974.

38. FSN 1560-944-2490

a. Problem area code. A, B, L

b. Noun. Windshield Center

c. Application. CH-47

d. Unit price. \$580.00

e. <u>Statistics.</u>	<u>Sep 73</u>	<u>Mar 74</u>	<u>Aug 74</u>
ALT	4 MO	8 MO	8 MO
PLT	3 "	5.2 "	5.2 "
SL	1.7 "	2.7 "	3.7 "
AMD	20	18	19
DI	173	193	302
DO	71	124	116
OH	0	14	9

f. Discussion. There had been intensified demands at the close of the Vietnam conflict. Procurement actions could not be finalized due to insufficient funds at that time. The increase in PLT from September 1973 to March 1974 was caused by a new design configuration after a contract was awarded.

39. FSN 2915-999-3705 or 2915-018-0012

a. Problem area code. F, G, J, I

b. Noun. Submerged Pump

c. Application. UH-1

d. Unit price. \$161.00 or \$315.00

e. <u>Statistics.</u>	<u>Jan 74</u>	<u>Aug 74</u>
ALT	1 MO	3 MO
PLT	4 "	6 "
SL	1 "	3.2 "
AMD	74	14
DI	136	524
DO	623	895
OH	323	137

f. Discussion. A change in stock number had precluded any supply control printout until February 1974. In the meantime, demands had accumulated against the old stock number and did not, therefore, provide the real stock position. Actions to fill demands were completely manual from June 1973 until February 1974. Overhaul actions have not always kept pace with requirements.

40. FSN 1680-453-5677

a. Problem area code. B

b. Noun. Seat Cover

c. Application. UH-1

d. Unit price. \$24.70

e. <u>Statistics.</u>	<u>Jun 73</u>	<u>Nov 73</u>	<u>May 74</u>
ALT	2.6 MO	3.5 MO	4.8 MO
PLT	8.9 "	5.7 "	5.8 "
SL	1.4 "	1.9 "	2 "
AMD	121.8	169	433
DI	1996	1335	4570
DO	15	168	786
OH	360	0	0

f. Discussion. Contractor delinquency of 750 each during the middle and latter months of 1973 had caused the zero balance. Action taken in October 1973 by procurement personnel to expedite delivery would appear to be sufficient to resolve the problem. However, deliveries have not been made and the item has been zero balance since November 1973.

41. FSN 1615-063-6635

a. Problem area code. J

b. Noun. Drive Shaft Assy

c. Application. UH-1

d. Unit price. \$1464.00

a. <u>Statistics.</u>	<u>Dec 73</u>	<u>Aug 74</u>
ALT	1 MO	5 MO
PLT	9 "	10 "
SL	2.8 "	2 "
AMD	83.8	84
DI	247	217
DO	340	576
OH	0	5

f. Discussion. The overhaul program at ARADMAC (US Army Aeronautical Depot Maintenance Center), with an output schedule of 91 per month, was the basic source of supply. The output in early 1974 from this program was negligible with the limiting factor identified as the boot assembly. Premium pay was offered and accepted by the contractor to expedite delivery in June 1974 rather than the original delivery month of September 1974. The depot overhaul program was amended to increase the production from 91 to 200 per month. A quantity of 378 boots was shipped from the contractor, by truck, to Sharpe Army Depot but could not be located. Arrangements were then made to transport future shipments by air. At the time of the survey 1600 boots were still due out to ARADMAC.

42. FSN 1615-689-6306

- a. Problem area code. B, J
- b. Noun. Stabilizer Bar Assy
- c. Application. UH-1
- d. Unit price. \$1,005.00
- e. Statistics.

	<u>Aug 74</u>
ALT	3 MO
PLT	13 "
SL	1 "
AMD	3

DI	0
DO	12
OH	0

f. Discussion. In the past, AVSCOM had experienced difficulty in the procurement of these items. In order to reduce the increasing number of backorders an engineering decision was made to increase the maximum allowable hours of life on two components of the end item. This decision permitted 154 items, held in condition code B, to be released against outstanding backorders, thereby negating procurement action at that time.

43. FSN 1615-829-6855

a. Problem area code. A, B, D

b. Noun. Universal Control

c. Application. UH-1

d. Unit price. \$19.89

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	2 MO	4.8 MO
PLT	12 "	10 "
SL	2.3 "	2.9 "
AMD	191 (Issue)	158.9 (Issue)
	14.8 (Overhaul)	19.5 (Overhaul)
DI	6357	5157
DO	374	378
OH	0	157

f. Discussion. During the period January to June 1973 a critical asset position arose as a direct result of unprogrammed demands and the contractor's ability to meet contract delivery dates. Realizing this situation in May 1973 premium pay was offered and accepted by the contractor to expedite delivery of 600 items by 60 days. Reasons given by the contractor in December 1973 for delinquent shipments were as follows:

(1) Critical labor shortage and lack of trained employees.

(2) 400 items were scrapped due to production imperfections.

(3) Sub-contractors' failure to meet scheduled delivery dates.

(4) Increased cost of production.

44. FSN 1615-141-0076

a. Problem area code. P, J

b. Noun. Boot

c. Application. UH-1

d. Unit price. \$40.41

e. <u>Statistics.</u>	<u>Dec 73</u>	<u>Aug 74</u>
ALT	1 MO	1 MO
PLT	8 "	8 "
SL	2 "	2 "
AMD	318	619
DI	4588	5097
DO	2781	3559
OH	0	385

f. Discussion. This item is the component of item #41 which created the critical supply position already discussed in some detail. In addition to the increased overhaul requirements from 91 to 200 per month the issues to support field demands increased from 166 to 419 in an eight month period. In January 1974 action was taken by AVSCOM to request contractor delivery every 15 days, rather than 30, and to move the parts by air in lieu of surface means.

45. FSN 1615-772-7714

a. Problem area code. C, L, M

b. Noun. Filter

c. Application. UH-1

d. Unit price. \$47.37

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	3 MO	6 MO
PLT	5 "	4 "
SL	2 "	10 "
AMD	19.5	19
DI	160	85
DO	15	233
OH	14	0

f. Discussion. In October 1973 sufficient assets were on hand to meet all NORS requirements. However, a shortage of funds during the November 1973 to February 1974 time frame would not permit procurement action even though supply control studies indicated buy positions.

46. FSN 1730-427-7939

a. Problem area code. A, C, M, O

b. Noun. Tie Down

c. Application. UH-1

d. Unit price. \$6.92

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	4.9 MO	6 MO
PLT	3.2 "	7 "
SL	1.3 "	10 "
AMD	168	nd
DI	nd	9472
DO	nd	3566
OH	0	0



f. Discussion.

(1) The tie down reached a critical supply position because of untimely procurement, and the subsequent excessive ALT involved in award of a contract by the Procurement Division.

(2) A procurement request for 3,000 each was made in March 1973. A request was made to expedite the procurement work directive 18 May 73. No reply was received from the Procurement Division. A second request was made on 14 August 1973. The reply received gave an estimate date of award of 28 September 1973, and this was not considered adequate. As of 14 November 1973 a contract had not been awarded and the Legal Office had recommended to the Procurement Branch to cancel the contract package, due to discrepancies in unit price quotes, and to re-submit for solicitation. This procurement work directive reached its eighth month ALT and with the process of new solicitation it would take approximately 90 days before it could be placed on contract.

(3) A procurement request for 700 each was made on 17 May 1973. An award was made 18 September 1973 resulting in an ALT of four months. In accordance with the contract delivery schedule 700 each were due-in from the contractor on 9 November 1973. As of 14 November 1973 the contractor had not made the shipment. A request was submitted to the productive division to expedite the delinquent contract.

(4) A procurement request submitted 21 August 1973 for 575 each was scheduled to be awarded within the following three or four weeks. The result was another contract with ALT of four months. During this period ALT used in inventory policy was 3.2 months.

47. FSN 1560-999-0307

a. Problem area code. A, K

b. Noun. Window Panel Cabin Roof

c. Application. UH-1

d. Unit price. \$238.00

e. <u>Statistics.</u>	<u>Nov 73</u>	<u>Aug 74</u>
ALT	1 MO	2 MO
PLT	9 "	13 "
SL	1.3 "	2.4 "

AMC	44.3	45
DI	1180	1759
DO	281	334
OH	20	11

f. Discussion. One significant factor which contributed to a less than desirable asset position was the fact that a fire occurred at the contractors plant. This resulted in an increase in the PLT from 9 to 13 months during the period November 1973 to August 1974. It was also noted that procurement was reduced from the supply control study recommended buy quantities due to AVSCOM's austere buy policy.

48. FSN 1620-967-1806

a. Problem area code. B, C, M

b. Noun. Shoe Assy

c. Application. UH-1

d. Unit price. \$40.43

e. <u>Statistics.</u>	<u>Sep 73</u>	<u>Aug 74</u>
ALT	1.1	2
PLT	6.6	12
SL	1.2	9.4
AMD	139	107
DI	917	2277
DO	nd	1154
OH	nd	0

f. Discussion. The PLT for this particular item increased from 6.6 months in September 1973 to August 1974. During the same period the SL jumped from 1.2 to 9.4 months while the AMD decreased from 139 to 107. Item managers stated that the flying hour program has a significant impact on the overall supply posture. Efforts to remedy the situation by premium payment proved unsuccessful.

49. FSN 1620-967-1804

a. Problem area code. B, C, M, O

b. Noun. Skid Shoe

c. Application. UH-1

d. Unit price. \$41.24

e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	1 MO	2 MO
PLT	6.7 "	12 "
SL	1.3 "	9.3 "
AMD	105	105
DI	nd	3153
DO	nd	571
OH	nd	0

f. Discussion. The initial cause of a poor asset position on this item was the scarcity of .063 gage steel. Contractors were not able to deliver in accordance with the contract and were thus delinquent in deliveries. Realizing this problem, an agreement was made to use .074 gage steel resulting in a six month gap in production when no items were delivered.

50. FSN 1615-866-6005

a. Problem area code. A, B, C, M, O

b. Noun. Fitting, Retention

c. Application. UH-1

d. Unit price. \$72.74

e. <u>Statistics.</u>	<u>Feb 73</u>	<u>Feb 74</u>	<u>Aug 74</u>
ALT	1.3 MO	1.3 MO	1.5 MO
PLT	5.1 "	9 "	10.6 "
SL	1 "	1.7 "	9.2 "

SL	1 "	1.7 "	9.2 "
AMD	27	7.1	8
DI	nd	nd	1053
DO	nd	nd	272
OH	nd	nd	0

f. Discussion. The PLT for this item increased from 5.1 months in February 1973 to 10.6 months during August 1974. During this time delinquent deliveries from the contractor coupled with a higher priority for application of the part to end item production created a less than desirable stockage position. Tooling problems by sub-contractors also contributed to the situation. The overhaul factor increased from 50 for each 100 aircraft to 150 for each 100 aircraft. A problem also existed in the receipt quantities indicated in the printed asset balance and those known by the item manager. These changes were often difficult to insert into the ALPHA program and were not in agreement with AMC policy at that time.

51. FSN 1560-409-9146

- a. Problem area code. B, C, M
- b. Noun. Support Structure Assy
- c. Application. UH-1, TH-1
- d. Unit price. \$38.32

e. <u>Statistics.</u>	<u>Jan 73</u>	<u>Aug 74</u>
ALT	1.6 MO	2 MO
PLT	6 "	13 "
SL	1.6 "	10 "
AMD	86	57.3
DI	nd	640
DO	nd	176
OH	nd	183

f. Discussion. At the time of the study team survey the problem appeared to have been resolved. In February 1973 it was realized by the commodity manager that a machine error had overstated available assets and procurement action was necessitated. The rapidly increasing PLT from six to 13 months and delay in expediting procurement actions contributed to a low balance status during calendar year 1973 and the early part of 1974.

52. FSN 1560-106-4546

a. Problem area code. A, B, C, M

b. Noun. Grip Assy

c. Application. UH-1

d. Unit price. \$65.95

e. <u>Statistics.</u>	<u>Jul 73</u>	<u>Aug 74</u>
ALT	3 MO	4 MO
PLT	5 "	8 "
SL	1.4 "	6.6 "
AMD	54.5	65
DI	nd	1801
DO	nd	815
OH	109	0

f. Discussion. Although the machine studies indicated ALT's of three and four months respectively for the July 1973 and August 1974 periods, in actuality a nine month ALT existed. The primary reason for this excessive ALT was stated as a lack of funds. It was also pointed out that the PLT was in reality 14 months rather than the eight months depicted on supply control studies. The reason stated by the item manager for such a long PLT was the necessity for a government inspection prior to acceptance.

53. FSN 1560-948-0423

a. Problem area code. A, B, C, M

b. Noun. Connection Link

c. Application. UH-1

d. Unit price. \$31.52

e. <u>Statistics.</u>	<u>May 73</u>	<u>Jul 73</u>	<u>May 74</u>	<u>Aug 74</u>
ALT	1 MO	1 MO	4 MO	4 MO
PLT	11 "	11 "	13 "	7 "
SL	1.8 "	6 "	4 "	6.2 "
DI	nd	nd	nd	356
DO	nd	nd	nd	35
OH	nd	nd	nd	0

f. Discussion. The primary problem, as stated by the item manager, was due to an excessive ALT. The delay in award of contracts was due to the command's requirement to correct the funds cited in the master data record. Another problem surfaced during the research on the item revealed problems in the sub-contractor's failure to furnish material in a timely manner, thereby resulting in delinquent delivery. An interesting note was a statement that procurement personnel indicated on one of the supply manager's requests for expedited action that "no time was available for Defense Materiel System (DMS) action."

54. FSN 1560-014-2036

a. Problem area code. A, C, J, M

b. Noun. Frame Assy, Cowl

c. Application. UH-1

d. Unit price. \$67.49

e. <u>Statistics.</u>	<u>Jun 73</u>	<u>Aug 74</u>
ALT	1 MO	8 MO
PLT	7 "	8 "
SL	2 "	10 "
DI	807	272
DO	212	0
OH	236	56

f. Discussion. Difficulties in getting the item on contract caused the ALT to increase from one to eight months. There was stock on hand at the time of a requisition in July 1973, but the stock was not used to fill the requisition because items were in a condition other than available for issue. Fabrication attempts had not materialized because these costs were prohibitive. The contractor was delinquent on the delivery date of 24 June 1974 and Supply Management had requested, on 19 July 1974, expedited delivery of the outstanding procurement.

55. FSN 1560-894-6542

a. Problem area code. A, C, L, M

b. Noun. Tube Assy

c. Application. UH-1

d. Unit price. \$14.63

e. Statistics. Aug 74

ALT	3 MO
PLT	7 "
SL	10 "
DI	6806
DO	0
OH	57

f. Discussion. The critical supply position was due to untimely requests for procurement actions during the early ALPHA phase and excessive ALT. Premium pay was authorized but Procurement would not give the contractor written authority; and by the time he was notified it was too late to improve the delivery schedule. From all indications a requirements type contract would have prevented the excessive ALT. The item was out of stock in April 1972 and by October 1973 there were 352 requisitions on backorder. There was a due-in deficiency of 965 each in August 1974 because of a policy not to buy up to full requirement but to determine actual requirements up to reorder warning point, causing the buy program to actually be three months short.

56. FSN 1560-834-6624

- a. Problem area code. C, M
- b. Noun. Support Structural Assy
- c. Application. UH-1
- d. Unit price. \$11.59
- e. Statistics. Aug 74

ALT	2 MO
PLT	5 "
SL	7 "
DI	2590
DO	282
OH	37

f. Discussion. The ALPHA programs had caused the requirements/demands, on hand quantities, and due-in quantities recorded in the supply control studies not to be accurate. For instance, 539 each due-in was not recorded in the September 1973 supply study. The recorded ALT in the August 1974 study was two months and should have been one month, PLT was five months and should have been ten months, and the SL was seven months and should have been only two months. While premium pay was being offered as one means of expediting delivery, the fact that additional funds were offered may or may not have caused the contractor to delay delivery in order to take advantage of this possibility.

57. FSN 1560-765-6253

- a. Problem area code. C, L, M
- b. Noun. Block Support, Skid
- c. Application. UH-1
- d. Unit price. \$5.14



e. <u>Statistics.</u>	<u>Oct 73</u>	<u>Aug 74</u>
ALT	5 MO	5 MO
PLT	5 "	11 "
SL	6 "	9 "
AMD	61	54.5
DI	621	562
DO	92	0
OH	0	93

f. Discussion. In October 1973, the contractor indicated he would be able to expedite 300 each for premium pay of fifty cents additional per unit. This action to expedite delivery did not appear to be timely in that available stocks became depleted prior to the time of contract delivery and receipt of NORS requisitions.

58. FSN 1560-873-2265 or 1560-757-4849

- a. Problem area code. C, I, L, M, D
- b. Noun. Hinge, Access Door
- c. Application. UH-1
- d. Unit price. \$11.43

e. <u>Statistics.</u>	<u>Nov 73</u>	<u>Aug 74</u>
ALT	3.5 MO	6.4 MO
PLT	5.2 "	14.5 "
SL	1.6 "	10 "
AMD	95	92
DI	1560	2532
DO	392	271
OH	386	24

f. Discussion. The contractor went out of business, closed shop, and could not be located and, from all indications had abandoned the contract as of 1 August 1974. There

were 519 each on back order, of which 23 each were NORS requisitions. There were 200 each shipped by another contractor in June 1974 but were not adequate to support total requirements. Procurement had advised Supply Management to issue a request for new procurement action in view of the contractor default, which would further delay a get well date.

59. FSN 1615-847-7461 or 1615-178-9680

a. Problem area code. J, K

b. Noun. Main Roter Blades

c. Application. AH-1, UH-1

d. Unit price. \$4,304.00

e. <u>Statistics.</u>	<u>Dec 73</u>	<u>May 74</u>
ALT	2 MO	2 MO
PLT	17 "	12 "
SL	3 "	3 "
AMD	94	55
DI	575	870
DO	100	455
OH	707	45

f. Discussion.

(1) A safety-of-flight one-time inspection of items with total operating time of 55 hours or more was made. As a result, 700 each were rejected on the first inspection which depleted all available stocks. Deliveries were scheduled as follows: 40 each, August 1974; 70 each, September 1974; 100 each, October to January 1975; and 53 each, February 1975.

(2) The estimated get well date for all NORS requisitions was March 1975, and for all other dues-out June 1975.

60. FSN 1560-454-0256

a. Problem area code. 0

b. Noun. Window Assy

c. Application. AH-1

d. Unit price. \$863.00

e. <u>Statistics.</u>	<u>Dec 73</u>	<u>Aug 74</u>
ALT	2.5 MO	2 MO
PLT	7.2 "	6 "
SL	2.6 "	1 "
AMD	13	13
DI	179	105
DO	69	0
OH	0	71

f. Discussion. An overhaul work stoppage had occurred due to delays in contractor delivery of sufficient quantities of units in the primary stock number. Suitable substitute window assemblies were ultimately used to alleviate the problem. The authority to intermix clear and tinted canopy glass was also granted. Since the period of subject NORS requisition in 1973 the situation has been corrected.

61. FSN 1615-515-4240

a. Problem area code. B, J, O

b. Noun. Freewheeling Assy

c. Application. UH-1

d. Unit price. \$1,198.00

e. <u>Statistics.</u>	<u>Aug 73</u>	<u>Aug 74</u>
ALT	2 MO	2 MO
PLT	11 "	12 "
SL	2.5 "	2.5 "
AMD	26.4	23.5
DI	131	343
DO	26	31
OH	1	107

f. Discussion.

(1) The background of supply status at time of the NORS requisition (from the repair parts sample) in 1973 is as follows: The overhaul contract was awarded in June 1972 to Acme Tool with the full knowledge that this company did not possess the required test stand to perform a green run (TEST).<sup>62</sup> This resulted in the first overhaul being slipped to February 1973, during which time Acme Tool was building a test stand. And since February 1973, output has been, at the very best, sporadic. As an example, the history of the test stand's operation over a two-month period in 1973 is that in August it ran nine days and in September it ran less than two days.

(2) The test stand had been labeled the "African Queen" and consists of an old diesel engine, an old truck differential, and a water brake from an old Navy surplus test stand. The contractor had been delinquent for 47 months, and adequate support was dependent entirely upon output from the overhaul program. Efforts to obtain a contract with Bell Helicopter Co., to test units until Acme Tool had its own test capability, had been only partially successful.

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62. The fictitious name "Acme Tool" is used in lieu of the actual name of the contractor.

**APPENDIX H**

**SCORES EVALUATION OF  
CONCLUSION AND RECOMMENDATION**

APPENDIX H  
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1. The scenario evaluation of the conclusions and recommendations of this study is being coordinated separately with the Logistics Center to determine if such an evaluation is appropriate to a study of this nature.
2. Since the study concentrated on CONUS based divisions and the wholesale echelon of supply, it appears doubtful that the SCORES evaluation process is applicable to the status of repair parts supply based on peace time demand data. The data collected provides a typical baseline situation of repair parts stockage at the time of mobilization but the actions recommended to correct the situation cannot be implemented on a short term basis to react in a 60-day conflict.

## **APPENDIX K**

## **REFERENCES**

## APPENDIX K

### REFERENCES

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APPENDIX L

GLOSSARY

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### GLOSSARY

1. ADP. Automatic data processing.
2. ALT. Administrative Leadtime. The time from the date the procurement work directive is generated to the date a contract is awarded.
3. ALPHA. Army Materiel Command Logistics Program Hardcore Automatic.
4. AMDF. Army Master Data File.
5. ASL. Authorized stockage list. A list of all items authorized to be stocked at a specific echelon of supply.
6. BASOPS. Base Operating Information System.
7. CS3. Combat Service Support System.
8. Delphi Technique. A problem solving technique involving the use of independent groups. The results from each group are then distributed to all other groups in order that each group may review and possibly revise their original solution. The concensus is considered as the solution.
9. Demand accommodation. The percent of total valid demands received which match the items on the authorized stockage list.
10. Demand satisfaction. The percentage of valid customer requisitions for authorized stockage list items that are filled.
11. DIC. Document Identifier Code.
12. DLOGS. Division Logistics System.
13. DMOS. Duty Military Occupational Specialty.
14. DMS. Defense Materiel System.
15. DPS. Defense Priority System.
16. DSS. Direct Support System.
17. DSU. Direct Support Unit.

18. Frustrated Cargo. Any shipment of supplies and/or equipment which while enroute to destination is stopped prior to receipt and for which further disposition or instructions must be obtained.
19. IFB. Invitation for Bid.
20. ISO. Installation Supply Office.
21. LIF. Logistics Intelligence File.
22. MOS. Military Occupational Specialty.
23. NICP. National Inventory Control Point.
24. NORM. Not Operationally Ready, Maintenance.
25. NORS. Not Operationally Ready, Supply.
26. NSL. Nonauthorized stockage list. Items not authorized to be stocked at a specific echelon of supply.
27. OROSS. Operational Readiness Oriented Supply System.
28. ORR. Operational Readiness Rate.
29. OST. Order and shipping time. The time elapsing between the initiation of stock replenishment action for a specific activity and the receipt by that activity of the materiel requested.
30. PLL. Prescribed Load List. That quantity of repair parts authorized by major commanders to be on hand in units. Normally a 15 days supply.
31. PLT. Production Leadtime. The time from the award of the contract until receipt of the materiel.
32. PMOS. Primary Military Occupational Specialty.
33. RDT. Requirements Determination Time. The time required to complete and review requirements computations. Measured from the time assets are equal to or less than the reorder point until completion of the procurement work directive.
34. RO. Requisitioning Objective. The maximum quantity of materiel to be maintained on hand or on order. Consists of stocks represented by the operating level, safety level, and order and shipping time.
35. SAILS. Standard Army Intermediate Level Supply System.
36. SCR. Systems Change Request.

37. Standard Deviation. A measure of variation around the arithmetic mean. Computed as the square root of the summed squared deviations from the mean divided by the sample size.
38. Stock availability. The percentage of valid customer requisitions for stocked items that are filled on the first pass.
39. Stockage criteria. The set of rules used to determine when to add and delete items from the authorized stockage list.
40. Stockout. A zero balance of an ASL item or the non-availability of an NSL item.
41. TEC. Training Extension Course.
42. Variable order and shipping time. The computation of OST by individual stock numbers or by materiel category rather than a fixed number of days for the entire ASL.
43. Zero balance. An ASL item with no stock on-hand.